SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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TH WALES INSTITUTE OF ENGINEERS.

nnual general meeting of members was held at the Royal Cardiff, on April 24. The President, Mr. T. DYNE STEEL, C.E., occupied the chair, and there was a large attendance of rs, including Mr. Alex. Bassett, M.Inst. C.E, Cardiff; Mr. T. r Brown, Cardiff; Mr. T. Joseph, Treherbert; Mr. G. F. Adams, ; Mr. James Murphy, Newport; Mr. David Thomas, Rhym- Mr. Edwin Richards, Chepstow; Mr. Geo. Wilkinson, Powell's n; Mr. Matthew Truran, Dowlais; Mr. Geo. Birbeck, Lon- Mr. Jas. Barrow, Maesteg; Mr. Jas. M'Murtrie, Radstock; . G. M'Murtrie, Llwynpia; Mr. Thos. J. Price, Pencoed; Mr. J. Stevens, Newport; Mr. Matthew Bates, Cyfarthfa; Mr. nape, Powell's Duffryn; Mr. Mark Lee, Cardiff; Mr. Charles mes, Merthyr; Mr. John Corner, Newport; Mr. R. S. Roper, rt; Mr. David Evans, Aberdare; Mr. Walter Bell, Merthyr Mr. Geo. J. May, Neath; Mr. David Joseph, jun., Treherbert; ort. Huxham, secretary, and numerous other gentlemen.

PRESIDENT, in opening the proceedings, said the members doubtless aware that the date of this meeting had been post- from January, in consequence of circumstances which he was ey had all greatly regretted; but the council had considered undesirable that a meeting should be held in the midst of the truggle which had only recently been brought to a close, and ld now be requisite that an extra meeting should be held dur- e summer, to work up the arrears of business.

tineers were appointed to open the ballot papers, and the fol- g gentlemen were declared to be duly elected as members of stitute:—Mr. James Colquhoun, general manager, Llynvi Iron- s, Maesteg; Mr. John Richards, engineer, Newport; Mr. John r Corner, engineer, Newport; Mr. Geo. C. Hewitt, mining en- r, Coal Pit Heath, Bristol; and Mr. Wm. Evans, Cardiff, as a ate.

PRESIDENT then laid before the members a statement of the s of the Institute to the conclusion of the last session, which d that the Institute comprised 168 members, 5 associates, graduates, and that the balance in hand amounted to the sum 29*l.* 19*s.* 8*d.*; and said that this was a favourable and progres- tate of things, and credit was due to the present secretary for g brought the affairs into such a satisfactory condition.

er the conclusion of the annual official business, the discussion pers read at previous meetings were proceeded with.

. DAVID THOMAS had read a very able paper on the "Avon y Mineral District" at a previous meeting, and there ensued a and animated discussion as to the identity of various seams in district with those in other parts of the coal field, in the course hich other members promised to prepare sections and particu- of the intervening districts, so as to extend the sectional lines ward into the Rhondda and Rhymney valleys.

THE MINERS' DIAL—BY CHARLES HENRY JAMES.

this paper, which next came on for discussion, the author ted out the errors likely to arise in the construction of colliery king plans by trusting to the magnetic needle in conducting erground surveys, consequent on continual variation and depres- of the needle, and the disturbances arising from local attrac- and strongly advocating the system of working with a "fast le," and using the compass-box as an angleometer for traverse eying, by which means he obtained very accurate results with dial, preferring it to the theodolite as an instrument for under- nd surveys. In connection with the use of the dial as a travers- instrument, he also advocated the adoption of "co-ordinate plot- " or the method of computing the position of the several hts," or "stations," by trigonometrical computations, reducing he angles to measured distances of latitude and longitude, pre- ing to accomplish this by the use of logarithms, rather than be endant on tables constructed for use with the protractor. Sub- ed is the abstract:—

curacy in colliery plans and in laying out workings is most important, and is great saving in both time and money; by it no labour or time is lost in headings that may afterwards have to be straightened or otherwise altered. y surveyors contend that the ordinary miners' dial is not a trustworthy in- ment, and cannot be depended upon. The author brought forward cases that occurred in his practice, showing that the dial may be used, and very fair re- obtained. The dial he generally uses is made by Casartelli, of Manchester; ace, 8 in. in diameter, is divided into degrees, and by the vernier can be read ree minutes. It has a ball and socket neck. The upright sights are carried n outer ring concentric with the dial, and, by means of an arc, vertical angles e read up to 30°. He has found the employment of three sets of dial legs to great improvement: the central set to carry the dial, the other two with brass to hold lamps for the back and fore sights. In practice the dial is from time me removed from the central set to that in front, the cup and lamp being then l on the legs from which the dial has just been moved, at the same time the l set is carried forward with the cup and lamp to act as a fore sight. To avoid nconvenience of change of magnetic bearing he lays down fixed points, from h at future times the plan can be extended. Where there are two distant s connected underground it is well to peg out a straight line between them, arefully take its magnetic bearing by back and fore sights. Then a careful ey should be made underground from shaft to shaft, leaving two or more per- ent marks near each pit. Such survey, if made with the fast needle, should s as regards distance from shaft to shaft with great exactness.

reading the magnetic bearing it is usual to read off the north end of the needle. not possible by this means to read off nearer than ½°, or 7½ minutes. The hod recommended by the writer is to place the instrument on the central set gs, and after carefully levelling it, to set the needle to zero, care being taken all iron is moved as far as possible from the instrument. The dial is then ly clamped, and by means of the vernier screws the sights are brought to bear he back and fore objects. After reading the foresight the vernier is clamped, the dial taken off the centre legs, substituting the brass cup and lamp, and on the fore set of legs. Keeping the same end of the instruments forward, the vernier still clamped, the sights are then brought to bear on what is now back sight, and fixed firmly; the vernier is then unclamped, and by the ver- screws the sights are again brought to bear on the fore sight, and the angle off. By this method you are enabled to read off to three minutes, or by esti- ion to one minute, and it has the great advantage that the north end of the le always lies to zero, and so, unless affected by local attraction, it gives an in- ndent check, and the readings of the vernier are magnetic bearings.

the ordinary dial is usually marked for reading by the loose needle, with west e right of north, and east to the left, it is necessary to remember that in work- with the fast needle, this must be reversed; thus, N.W. must be read N.E., and n. He finds it better, however, in practice, to enter all the bearings as they are on the dial, taking care to reverse them in the office book. By this method he bearings are connected with one common meridian line. Much of his ac- cy, however, appears to be due to his mode of plotting, by which he avoids enormous liability to err when the ruler, protractor, and scale are relied upon. the use of a table of natural sines and cosines, or what is far more simple in ctice, a table of logarithms and logarithmic sines and cosines, he is enabled to without a protractor, and all measurements can be made from one original idian line and line of longitude, instead of in each set. The paper contains erous examples, and he remarks that being able to check your work, calculate r position, or bearing, without plotting your survey, will, he thinks, be found a great advantage in practice; and the extra care and trouble required will be found to be more than repaid in the accuracy of the results obtained.

The PRESIDENT thought Mr. James had written a very interesting and clever paper on a matter of vital interest to everyone connected with collieries; but he could not agree with Mr. James's remarks in respect to the theodolite, which he considered a most valuable instrument for underground surveying, and indispensable where great accuracy was required. He had found no difficulty, by having a short pair of legs, in using an ordinary 5-inch theodolite in very narrow underground places. For accuracy and completeness he did not know of any instrumeut that was equal to the theodolite.

Mr. H. HUXHAM thought there could be little question that the subject of correct underground surveying, so ably introduced by Mr. James, was a matter of vital interest to the mining engineer, and to all those who valued the importance of correct plans. The system advocated in the paper under discussion, although not now noticed for the first time, had many features to strongly recommend it to the attention and practice of the intelligent and accurate surveyor. He believed that the earliest work on this subject was by Mr. Fenwick, a North of England colliery viewer, which first appeared in 1804, and contained a most elaborate description of compass surveying: the second edition was published in 1822, and contained a set of traverse tables to every degree, and to different radii of units; and its author strongly recommends the use of the circumferentor as a traversing instrument, with the "fast needle," rather than trusting to the magnetic needle. Williams's "Geodosy," published in 1840, gives a good example of co-ordinate plotting, but he uses logarithims in filling up his office forms, which renders the method more complex than is necessary, as the use of good traverse tables is much more expeditious. He also advocates the employment of three stands or legs, which was first suggested in one of the volumes of the "Annales des Mines." In Gibbons's "Surveying," published in 1850, there are traverse tables computed to quarter degrees. Rickard, writing on mine surveying, in 1859, states that all traverse tables up to his time were inadequate, and but for the labour involved he would have computed a complete set. Baker, in 1861, re-published Fenwick's tables in their original form, without any improvement. Hoskold, in his treatise on "Mine Surveying," published in 1863, gives a very complete set of these labour-saving tables, calculated to every two minutes, and for radii from 1 to 500,000, to five decimal places; and the application of these tables to general surveying and co-ordinate plotting is fully explained, and the system strongly advocated. Hoskold, a London engineer, published in 1864 a small set of traverse tables to every five minutes, and for ten different radii, computed to three decimal places. In the same year Shortredge published an extensive set of 290 octavo pages of traverse tables to every two minutes, and for radii from 1 to 50, and to three places of decimals. Since 1863 Mr. Hoskold has devoted considerable time to a complete revision of his work on mine engineering, and has prepared an extensive and valuable set of traverse tables to every single minute, giving six places of decimals, for radii from 1 to 2,000,000 of units, occupying 176 folio pages. In 1870 Mr. W. F. Howard read an elaborate and valuable paper on "Practice in Underground Surveying, and Advocacy of Contour Mining Plans," before the North of England Institute of Engineers, advocating the use of the circumferenter with the "fast" needle, or as an anglometer, in preference to the theodolite for underground surveying, and combining this practice with co-ordinate plotting. He also strongly advocates the general use of contour lines on all mining plans, and points out their great utility for ready reference in the conduct of the underground workings. Lintern, in writing on this subject in 1872, published a set of traverse tables to every three minutes, with five different radii, and to two plans of decimals. The whole subject of mine surveying was one of the greatest importance in the conduct of extensive collieries, and he quite concurred with Mr. James in advocating the use of the dial as an angleometer, instead of trusting to the magnetic needle, and in the use of three sets of legs, so as to ensure the object-light and the instrument being correctly placed in their respective positions during the continuance of the survey. He had no doubt, also, that the use of trigonometrical computations and co-ordinate plotting would come into more general use, as the greater accuracy and convenience of this method must be obvious to all intelligent surveyors who value accurate results. In respect, however, to the preference given by Mr. James to the dial or circumferenter over the theodolite for underground surveying, he doubted the policy of advocating the use of an instrument inferior in every respect to the theodolite as an angleometer, and thus increasing the risk of error creeping into main survey lines. He considered the members were all much indebted to Mr. James for having so ably brought forward a subject of much interest and importance for discussion.

Mr. JAMES MURPHY had always looked upon the miners' dial as a rough instrument, and one not capable of giving accurate results, as generally used, and did not think there was any instrument equal to the theodolite, or that engineers of repute would use any other instrument in preference where great accuracy was required, and, therefore, did not consider it wise to discard it for underground surveying when its use was in any way practicable. He should like to have seen the object of Mr. James's paper stated in clearer terms. He then noticed the variation of the needle from 11° 15′ east of north in 1576, to 1657, when the "true" and "magnetic" north point coincided, and the gradual increase of westerly variation until in 1805 it stood at the maximum west variation of 25¼°, since which time it has been receding towards the true north. There was also a monthly, and even daily, variation disturbing the action of the needle, and rendering it a most uncertain standard for surveyors.

Mr. JAMES M'MURTRIE thought that in comparing the needle with other modes of surveying it should not be forgotten that there are many places to be surveyed in a pit where it would be impracticable to use a theodolite, and in those cases the dial must be used. During his practice with the theodolite, and in using the dial for traverse surveying, he had observed frequent fluctuations of the needle, varying as much as 2° and 3° when he had no reason to doubt the accuracy of the survey, and this local attraction of the needle was quite sufficient reason to induce accurate surveyors not to rely on its use for main lines of survey. In plotting work he thought errors frequently crept in from unobserved contraction of the paper. He knew a case in which a survey was plotted on paper and several accurate tracings copied from it, and in ten years afterwards, when there was occasion to compare the copies with the original, a difference of 1 in. in 6 ft. was found to exist from the contraction of the paper.

Mr. A. BASSETT remembered an extraordinary case in which a survey was plotted on new paper and laid by for some time in a warm room. Some time after, when the sections were plotted from the same survey, so great a difference was found between the plan and the sections that considerable confusion arose when the dimensions came to be scaled off.

Mr. COPE PEARCE considered that any difficulty of this sort might be met by surveyors writing the distances and heights in figures on the plan and sections, in the same manner as that adopted by mechanical engineers.

Mr. JAS. MURPHY remembered many years ago the fate of a railway Bill depended on the circumstance of the contraction of the paper upon which the plans were made. Mr. Hawkshaw was the engineer, and he proved that the contraction of the paper was such as to account for a difference of over 30 ft. in some of the measurements.

Mr. CHAS. HY. JAMES said, in reply to Mr. Murphy's observations, that in using the dial in the way he recommended he considered it was a theodolite; it was possibly rough, and could only be read to three minutes, yet to all intents it was a theodolite. He had frequently noticed the disturbance of the needle from local and other attractions, but he generally found it was not of long duration. The contraction of the paper was a source of much annoyance, and the method of plotting and computation advocated in his paper was to a great extent a safeguard against error, as the field-book contained the latitude and longitude (or distances) of each set or station of the survey in figures, and any point could thus be ascertained without plotting or trusting to scale at all.

The PRESIDENT said he did not know any more important subject than that of accuracy of survey, and the correct plotting of plans of underground working, not only to avoid trespass on adjoining minerals, but, more important still, to avoid accident by striking unintentionally into old workings full of water. Great loss and annoyance was sometimes occasioned in colliery operations by trusting to incorrect plans, which showed the coal area to be intact, whereas in reality it had been already worked, and sometimes an opposite state of things, as in a colliery now under his control, where he was working coal which according to the old plans had been all worked out before. He was sure the Institute was very much obliged to Mr. James for his valuable paper, and he begged to move that a vote of thanks be accorded to him for it.

The next paper for discussion was one read at the last meeting, on the—

USE OF COMPRESSED AIR UNDERGROUND FOR WINDING AND PUMPING—BY JOHN SNAPE.

It is now upwards of five years since compressed air was first used at the Powell's Duffryn Collieries, but it is only within the last 18 months that the machinery has been working successfully, though sufficient was seen of its working, and of its adaptability for underground hauling, to encourage the owners to persevere in its introduction. The first engines put down at Middle Duffryn were not altogether satisfactory; those at New Tredegar Colliery are giving every satisfaction. Mr. Snape believes that compressed air is in many instances the cheapest power that can be used for underground haulage.

The air-compressing engines consist of a pair of 21-in. diameter horizontal steam-cylinders, 5-ft. stroke. The air compressors are also 21 in. in diameter, working the same stroke, the pistons of both cylinders being attached to the same piston-rod. The compressed air is taken from the cylinders in pipes to a wrought-iron receiver, outside the engine-house. From this receiver it is taken in pipes, 6 in. in diameter inside, down the shaft, a total distance of 365 yards to the bottom; from this point it is conducted through 6-in. pipes to another receiver, a further distance of 88 yards. From this receiver the air is taken in 6-in pipes for a distance of 88 yards, to the hauling-engine, on the river side of workings. From the receiver to the hauling-engine, on the mountain side of workings, the length is 198 yards, 6-in. pipes being used. The receiver on the bank is 35 ft. long, by 5 ft. 6 in. diameter, and the plates are 7-16ths of an inch thick; that at the bottom is 35 ft. long, by 4 ft. diameter, with plates 3/8ths of an inch in thickness. Each hauling-engine consists of a pair of horizontal air-cylinders, 12 in. diameter, 18 in. stroke. The pinion on the crank shaft is 1 foot 3 in. diameter, working into a spur-wheel 7 ft. 6 in. diameter, on the drum shaft, being in proportion of 6 to 1. The drums are 3 ft. 6 in. diameter, and are put in and out of gear by sliding carriages, in the usual manner. The river side engine hauls (14 trams and coal) a total weight of 16 tons 16 cwt., and works a second drum, pulling empty trams. The mountain side engine is similarly worked.

A great deal has been said and written at different times on the loss caused by the great heat developed in compressing air, and it was originally the intention of the author to have made some experiments with the view of ascertaining what the loss amounted to, but after working out the results of the trials made to ascertain the useful effect obtained underground, compared with the power exerted at the surface, he did not consider it necessary to do so. He finds that if the receiver and pipes are charged with air to a pressure of (say) 40 lbs. per square inch, and the engines then stopped, and the air allowed to cool to the temperature of the surrounding atmosphere, there is no loss of pressure, and, consequently, there cannot be much loss of power. The pipes used for conveying the compressed air into the pit are of cast-iron, 6 in. diameter, in 9 ft. lengths, and with specially formed joints, which have proved thoroughly successful, and there has not been a single leaky joint since the pipes were first put down; and there is this advantage in the use of compressed air over steam, that in conveying it down the pit there is no necessity for expansion joints, which are always a source of trouble and require frequent attention; and, again, the pipes do not require lagging to prevent loss by condensation, and they can be fixed in either the upcast or downcast pit without impairing the ventilation. The pipes were made 6 in. in diameter, which is larger than absolutely necessary, as it was thought that by making them of this size they would act as reservoirs of power, and so assist the receivers. It is found that there is no loss of pressure in conducting the air through a long length of pipes. It is well known by all mining engineers that when steam is to be conveyed down a deep pit the loss by condensation is very considerable, and, probably, in many instances considerably more than 23 per cent., which, as shown above, is the loss in compressing air.

Mr. Snape considers that compressed air can be used with greater advantage if possible for pumping than for underground haulage, especially in deep workings, where the water to be raised is some distance from, and considerably below, the level of the pumping or winding shaft, and where in many cases for several reasons steam could not be applied with safety. There is now at Middle Duffryn Colliery a special pump worked by compressed air 1000 yards from the pit bottom, lifting equal to a perpendicular height of 50 ft. The advantages of the special pump for this work are that it requires no attention after starting, and will work any length of time without lubrication.

So great has been the success that a small engine has been obtained from Fowler and Co., of Leeds, with 12-in. cylinder and two drums for working a head and tail rope; the whole is carried on a light, but strong, wrought-iron frame, provided with wheels and axles set to the ordinary gauge of the trams. It is intended to use this, where by doing so two or three horses can be dispensed with. He mentions that wherever a pit is idle, no matter from what cause, whether from strikes, holidays, or bad trade, &c., the horses—although remaining idle—must be fed and regularly attended to, whereas the engines would incur no cost for maintenance, it becomes a most important consideration whether this source of expense cannot be done away with, or at all events considerably reduced.

Where a self-acting incline is used these small engines would be very advantageous, as, under present circumstances the road must be sufficiently wide for two trams to pass, and in making a road of the required width long heavy timber is required, whereas if the road were made for only one tram to run shorter timber would do, thereby effecting a saving in first cost, and getting rid of the liability to crush, owing to the great width of the road. The engines being made with two drums, one of them could be used for working the incline, and the other for bringing the trams from the face of the workings, if necessary.

It should not be lost sight of that when an explosion unfortunately happens in a pit the horses that are in it at the time are generally all lost. If engines were used

instead, though they might sustain some damage, it would not often happen that they could not be repaired for further work; and there is a still greater advantage, for, as these small engines are intended to be placed at the ends of the cross-headings, should an explosion take place the air-pipes afford a ready means of sending fresh air into the workings, which at such a time would be invaluable to the men. There is no doubt that, in many instances, if it had been possible to send air into the workings immediately after an explosion, very many lives would have been saved, for it is well known that far more lives are lost by suffocation than by actual burning.

The PRESIDENT said there was another paper on the same subject of compressed air to be read at the meeting that day, by Mr. A. J. Stevens, and it would, perhaps, be well for them to defer the final discussion to the next meeting, when that paper would lie before them for discussion. In the meantime, he might say he had carefully considered Mr. Snape's paper, and was obliged to differ from him as to the results he had deduced, for in working out his diagrams it does not appear that he has deducted the back pressure, but has taken the whole power from the upper line of the diagram to the atmospheric line, instead of that circumscribed by the indicator pencil, and in diagram calculated thus an engine improperly proportioned (as far as the exhaust part of the valve is concerned) would be shown to do as much work and as economically as the best made engine. From diagrams of the front and the back end of the steam cylinders to the air compressors, 21 inches diameter, 5-feet stroke, making thirty revolutions per minute, Mr. Snape makes the average pressure per square inch to be 26·84 lbs., and each cylinder equal to 84·385-horse power, or 168·77-horse power for the two cylinders. Now, if the diagrams are correctly taken, the average effective pressure is shown to be 23·22 lbs., which for 30 revolutions per minute would give 146-horse power for the two cylinders, being some 22·77-horse power less than given by Mr. Snape, or equal to a loss of 13 per cent. from the back pressure of the exhaust. In like manner the effective power of the 21-in. diameter air-cylinder of 5-ft. stroke and 30 revolutions per minute is shown by Mr. Snape to be 129·096-horse power, which should be reduced by allowing for the back pressure to 110-horse power. In the same way Mr. Snape makes the diagrams of hauling-engine 12-in. cylinder, 18-in. stroke, and 120 revolutions per minute to show 45·672-horse power for the two cylinders, and this, if correctly calculated, should be 42-horse power, and in the mountain hauling-engines 12-in. cylinder, 18-in. stroke, and 162 revolutions per minute. Mr. Snape's calculations give 85·538-horse power, which correctly should be 79-horse power for the two cylinders. It will be seen that the loss between the power exerted by the steam-cylinders and that developed by the air-compressors is some 15-horse power, or about 10 per cent., and the power stored up in the compressed air is again reduced by 3·5 lbs. per square inch required to draw the air into the cylinder, or some 16 per cent., reducing the effective horse-power of the compressed air to 110-horse power. From the diagrams of compressed air winding-engines it will be seen that the power exerted is 121-horse power, or 11-horse power more than that of the compressed air. But on working out the quantities it will be found that sufficient air is not compressed to keep the winding-engines working continuously at the given revolutions, so that comparing them by the time worked would not be a fair comparison, and by taking equal quantities of air compressed and used, and the amount of power in each, a just comparison may be made, which would result in showing that the quantity of air compressed per minute is 54 per cent. less than the total quantity used by the engines running continuously, or that the hauling-engines give out only 56-horse power, as compared with the 110-horse power stored up in the compressed air per minute. In these calculations no notice had been taken of the action of varying temperature on the air, or any loss from friction in the pipes. The weight of a column of air at atmospheric pressure equal to the depth of the shaft would be 65 lbs., but as it is compressed to one-third its volume it may be taken approximately at 2 lbs. Mr. Snape promised at the last meeting to make some experiments as to the temperature of the air before and after compression, and he now asked him to give the results of those experiments.

Mr. J. SNAPE said they had allowed the air-cylinders to cool to the temperature of the surrounding air before making any trials. By working the engines without any pressure on the pistons (the valves being open) for 30 minutes, the temperature of the air increased from 62½° Fahr. to 82½°, with a velocity of piston of 160 ft. per minute; during the next 30 minutes, with a piston velocity of 200 ft. per minute, and a pressure of 3 lbs. per square inch, the temperature of the compressed air rose to 97°. During the next experiments of 30 minutes each, the velocity of piston, as before, 200 ft. per minute, and a pressure of 10 lbs. per square inch, the temperature rose to 132 Fahr.; with a pressure of 20 lbs. to 165°, and a pressure of 40 lbs. per square inch to 220°; with this last pressure, indicated by the air compressors, the temperature of the compressed air as it escaped from the exhaust of the hauling-engines underground, was 44°. The compressing air-cylinders were cased with water, which, during the experiments, maintained a temperature varying from 50° to 62°.

Mr. BARROW's experience with compressed air led him to believe that the temperatures given by those experiments were, to some extent, due to the friction of the pistons in the air-cylinders, and not altogether to the latent heat in the air, and asked Mr. Snape if he had made experiments to determine this?

[To be continued in next week's Journal.]

DUDLEY MINING INSTITUTE.

An adjourned meeting of the South Staffordshire and East Worcestershire Institute of Mining Engineers was held on Monday, at the Museum, Dudley.—Mr. W. BLAKEMORE (the President) in the chair. There were about 70 members present. Mr. Daniel Whale, chartermaster, Tividale, Tipton, was elected an honorary member. The plans for the annual excursions were left in the hands of the Council to report to the Institute, Mr. HENRY JOHNSON (ex-President) reminding the meeting that the Institute had a warm invitation to South Wales. Mr. ALEXANDER SMITH, C.E., Dudley, exhibited and explained a number of models mentioned below. The first one was Spencer's revolving puddling machine, which was working night and day at West Hartlepool, converting 53 tons 15 cwts. of iron per week of ten shifts, and using only—

Coals at machine	Cwts. 12 1 20	
Pig iron	18 1 12	
Scrap-iron	0 0 10	Per ton of puddled bars,
Mill tap	2 3 0	of excellent quality.
Crushed tap	0 1 12	
Pottery mine	4 0 14	

The second model was one of Sparrow's apparatus for collecting the waste blast-furnace gases, and Mr. Smith claimed for it the credit of conveying the gases to the boilers and ovens in the simplest and cheapest manner, and that the system was most easily applied he proceeded to show by explaining that the gases were collected without shifting the platform. The next model was one of Jones's hot-blast ovens. This, also, was said to be economical, by reason of the hot air travelling twice through the oven instead of once. Mr. Smith then exhibited a model of Napier's differential reversing gear for rolling mills and other machinery. He said two inventors had submitted their systems at Glasgow during the meeting of the Iron and Steel Institute, but Napier's was the best. The last model shown was Omerod's patent safety link, for preventing the over winding of skips laden with men or coal. The model was worked several times, and on each occasion when the rope passed the pulley the cage or skip hung suspended between the guides, and, therefore, safe from harm.

The Rev. H. SANDFORD read a paper "On Mines' Schools in Germany." In opening, the reader said the 24th and 25th clauses of the new Act for the regulation of mines contained a provision that a person should not be qualified to act as a manager unless he should have passed an examination directed by the Secretary of State. The examination was chiefly to test the candidates' practical skill, but as theoretical knowledge was also demanded, he proposed to show them certain facts which had come under his observation in Germany. The schools differed chiefly from those in England inasmuch as the humblest classes employed in the mines have the benefits of the teaching extended to them. In every part of Germany there are schools of mining, but the two he wished to draw their attention to were at Saarbruck and Siegen. In the first locality the mines are worked by the German Government, and the school was supported by the State. In the second the mines are worked by private companies. The school at Siegen draws yearly about 120*l.* from the Government, and 350*l.* per annum is subscribed by the colliery owners, and these sums, augmented by a bequest of 90*l.* per annum, represent the income of the institution. The scholars have to pay nothing, but, on the contrary, they receive a trifle for lodging whilst attending the course. The teachers, five or six in number, receive 190*l.* per annum amongst them; but they have other sources of income. About 190*l.* was expended on the pupils, 40*l.* went for apparatus, and the whole expenditure reached about the sum of 500*l.* The programme of the Royal School at Saarbruck set forth that the objects are "to prepare young miners, who had had sufficient practical training, for the office of mining surveyors and managers, and accountants, through instructions in such branches of study as bear on the above occupations." The instruction in the preparatory schools was rather to revive in the minds of the pupils their primary training, and in the preparatory schools the instruction did not interfere with the youth's labour. The only additional subjects they studied were the rudiments of geometry and the construction of machines. At Saarbruck there were 75 scholars, at Siegen about 50. The subjects of instruction were—for the lower class—writing, drawing, arithmetic—especially the arithmetic connected with mining (mathematics),—mechanics and mechanism, surveying, chemistry, and geology. The subjects were the same for the upper classes, but, as might be expected, the scholars spent less time in writing and drawing, and more in studying mining and machinery. In regard to mathematics a practical turn was given to the instruction, the lower class studying mensuration, levelling, &c., and the upper class trigonometry applied to the measuring of angles (for ascertaining the heights of objects), the making of estimates, whilst the elements of algebra and the use of logarithms are taught to the upper and lower classes. To illustrate the laws in geology there were excellent maps and models, showing the position of the strata and the situation of the beds of ore. The greatest number of hours was given to surveying and drawing plans, the study of the machinery, and the science of working mines. When he (the reader) visited Saarbruck there were 30 young miners drawing plans of the workings. What was called mining science included instruction in the various gases found, how they were found, how to get rid of them, and how to recover those affected by them, the best kind of ventilation, the different kinds of roads, shafts, pumping apparatus, and the best way of preventing accidents. It might be questioned by some whether theoretical knowledge might be of much use in such matters. It would not be to persons who had no opportunity of practically applying the knowledge acquired; but he would remind them that all the students were practical miners taken out of the pits. Before they could enter they must have worked two years in the pits, and the average was five years service in the mines. To such as these instruction as to the causes and principles of everything they saw around them must, of course, be productive of good, and would enable them to be better guides and foremen to the other miners. A visit to the institution would show practical men how much was being done; and, as the German authorities were obliging, there would be no difficulty in obtaining information. Mr. Sandford then went on to show the vast difference between the regularly established schools of mines over Germany, and the objective arrangements in this country, and said he despaired of much being done to spread higher technical education among the mining boys of England until the Mines Act secured education for them after the age of 12 years. In Germany the boys attended school up to 14 years. The establishment of such mining schools in England would encourage steady and quiet conduct among the more ambitious and talented young miners, and would draw out that talent which had never been wanting in any class of the English people. Some might wish for the old plan, but all would have to change; and, as the old plan was not altogether perfect, they should hope that all that was good in it might be retained in that which was coming.

A hearty vote of thanks was given to Mr. Sandford for his paper, and this was acknowledged.

Mr. TOM PARTON, F.G.S., then read a paper on "Mining Progress." He commenced by stating that up to the 18th century coal had only been used to produce heat, but after that it was used to produce force, and then went on to show the early struggles of those who invented machines for raising the coal in larger quantities and keeping back the water. Mr. Parton treated on the gradual improvements in the sinking of shafts, general drainage, methods of working and ventilation, leaving the question of general safety operations for another evening. The paper was well received, and at the conclusion of the reading the PRESIDENT heartily thanked the reader.—A vote of thanks was passed to Mr. PARTON, who said he was always willing to impart knowledge for the benefit of the Institute.

Mr. WALTER NESS then read a paper on "Messrs. Baird's and Messrs. Frith's Coal-Cutting Machines." He said that, being in urgent want of manual labour, he had visited some pits where Messrs. Baird's coal-cutter was at work, and after that he had visited some other pits where Messrs. Frith's were employed. After elaborately describing each machine, and the manner in which it worked, Mr. Ness, in answer to several questions, said he thought Messrs. Frith's was the best for the shallow coal in the district.—A vote thanks was also accorded to Mr. Ness, and the compliment acknowledged.

THE CHEMISTRY OF THE MINE.

The third lecture under the auspices of the North Staffordshire Institute of Mining and Mechanical Engineers, by Dr. HILL, F.C.S., of Birmingham, was delivered in the Assembly Rooms, Stoke Town Hall. There was a very large and attentive audience. Mr. F. WRAGGE presided, and in briefly introducing the lecturer said he had taken a deep interest in the series of lectures, and he hoped they might contribute to a more scientific, and therefore safer, working of the mines of North Staffordshire.

Dr. HILL said in the two previous lectures he had discoursed, first upon the physical and chemical constitution of the atmosphere as being the medium in which all combustions and explosions occurred; and, secondly, the chemistry of carbon and hydrogen more especially, they being the two elements which entered into the composition of that compound which was called fire-damp; so that they were now in a position to consider fire-damp itself. Fire-damp was sometimes called light carburetted hydrogen gas, and marsh gas or pit gas. The formation of gas in marshes enabled them to understand its production in coal beds. It proceeded from the decomposition of vegetable matter in damp and watery places, and as all coal consisted of vegetable matter, the origin of the gas, if not the condition under which it was produced, in both cases was precisely similar, though possibly a higher temperature might have been concerned in the production of fire-damp than in that of marsh gas, which was produced at common temperatures, in presence of much moisture. Marsh gas could readily be collected by holding a bottle mouth downwards in the water of a stagnant pool which had decayed leaves on the bottom. By stirring up the mud with a stick the gas was disengaged and ascended in bubbles. Marsh gas, though containing black carbon, was as transparent and colourless as though it contained only hydrogen, and like that gas had neither taste or smell. He gave illustrations showing that carburetted hydrogen was combustible; that it was safe and simple when it was effected gradually; but just as the combustion was sudden and explosive when hydrogen and oxygen were thoroughly mixed and ignited, so, if they ignited a mixture of carburetted hydrogen, and inflamed the mixture, they suddenly united with a loud and violent explosion, the force of which was calculated to equal a pressure of 555 lbs. on the square inch. Fire-damp, then, exploded when mixed with either oxygen or air, and a light was applied; but it did not do so in all proportions. The most favourable proportions for explosions were one volume of fire-damp to eight or ten of air; but when the volume of air was either very small or very great no explosion occurred. When the air amounted to 17 times the volume of the gas this was the case, the large volume of air conducting the heat away, and preventing its rising high enough, while if the proportion of air was less than four times that of gas the quantity of oxygen was insufficient to burn it. Amongst the numerous synonyms of carburetted hydrogen he did not include one very commonly used amongst miners—sulphur. It was not sulphur, and contained no sulphur, and therefore it was as inappropriate to call it so as it was to call an article black lead which contained no lead, but consisted of carbon. This term sulphur applied to fire-damp was founded altogether on misconception; it was nothing more than a technical provincialism, and the sooner it was abandoned the better. He explained the principle upon which the Davy lamp was constructed, and gave several illustrations to show that with careful usage it was what it purported to be—a safety lamp. In speaking of the beautiful simplicity of the Davy safety-lamp a writer had said, "There may be seen the enemy in harmless coruscations, shorn of its strength, and imprisoned in a cage, which the wand of science has encircled around the angel of death." He referred to improvements effected in lamps for use in mines, and said that one invented by Mr. Upton Roberts, of Birmingham, was the best that could be used, it being theoretically and scientifically the safest lamp ever made. Having given some illustrations as to the paramount importance of a thorough ventilation of mines, he said besides having efficient ventilation, and carefully using safety lamps, it behoved the miner to attend to his personal habits. His occupation being necessarily dusty, and dusty particles being injurious both to the lungs and the skin, he should protect the first by wearing the beard and moustache, and relieve the second by frequent and thorough washing of the whole surface of the body. If a miner took his pipe and his glass—as he (Dr. Hill) did, because he thought there was no harm in it—he should take it in moderation; he should make his own home his club; and he should educate himself to a sense of the importance of his calling and the responsibility of his position, and thus become a benefactor to himself while diffusing happiness around him. (Applause.)

Mr. R. GARNER expressed his admiration of the lecture; but observed that, owing to the shortness of time, Dr. Hill had not mentioned any means of obviating the dangerous effect of choke-damp which he had described. He (Mr. Garner) had been making some experiments, and had found means of getting rid of carbonic acid gas, or choke-damp, almost immediately. The last time a serious explosion occurred in North Staffordshire there was a difficulty in getting into the workings on account of the choke-damp. From the experiments which he had made he found that it might be got rid of by water, which would absorb a quantity equal to its own bulk, and seven parts out of ten more, so that it was nearly twice its bulk. He held that if in a mine they were provided at any part, if they provided themselves with a hydropult—a machine used for throwing water, a large water engine, in fact—they could spurt the water amongst the carbonic acid gas, and absorb it in less than five minutes. He hoped to see what he suggested verified on a larger scale than he had been able to try it. He thought they ought to be happy to find introduced into that district what they had long wanted—lectures on science. (Hear, hear.)—Dr. HILL said he was quite aware that water would absorb carbonic acid gas; but bearing in mind the enormous quantity of carbonic acid in a large mine, the workings of which extended over miles, the water required to absorb a pit full of gas would prove a disastrous remedy. Lime water was effective; but such measures were too small. They must sweep out the carbonic acid by a current of air through the mine, and nothing else would serve to purify large workings.—Mr. GARNER said no doubt ventilation was the main thing, but in some cases water might be used. He proposed a vote of thanks to Dr. Hill for his lecture.

Mr. MOFFATT asked whether Dr. Hill thought it was possible for a blown out shot to cause an explosion where gas did not exist previous to the shot being fired?—Dr. HILL said they must have fuel before they could have fire. If there was nothing to burn they could not burn it. Carbonic acid was produced by an explosion of gunpowder.—Mr. MOFFATT said many persons believed that firing a shot with 2 lbs. of powder would cause an explosion of gas where no gas was known exist before.—Dr. HILL said he could not answer such a question unless he understood all the conditions which there ought to be. It was possible for a good deal of finely-divided coal dust to exist, and it might be burnt, but they must have something to burn before they could have an explosion.—Mr. STRICK said Dr. Hill had told them much that was new to them, and he hoped it would not be the last time they would hear him lecture. He (Mr. Strick) seconded the vote of thanks to the lecturer, which was carried with acclamation.—Dr. HILL acknowledged the compliment.—Mr. C. J. HOMER, in proposing a vote of thanks to Mr. Wragge, said he had been deeply interested in the course of lectures. They had been told what the gas was, and he should like to hear another lecture, so that managers of collieries might be enlightened as to the best means of dealing with gas so as to avoid explosions. As a new institute, a good start had been made, and having commenced with one good course of lectures they must not be satisfied, but must continue to have such lectures in future, so that they might gain all the information possible as to the means of managing mines with safety to those who were engaged in them. The vote of thanks being heartily passed, Mr. WRAGGE acknowledged the same.

Original Correspondence.

COLLIERY WORKING—MR. HERMON'S PRIZE ESSAYS.

SIR,—May I beg the favour of a few lines of space to express my surprise at part of the article on the Hermon Prizes which appeared in the Journal of April 26? I am a mining engineer, and I took the trouble to write an essay, in the hopes that I might gain the first or second prize. In Mr. Hermon's offer nothing was mentioned to the effect that mining engineers were not eligible to compete for the prizes, and if good practical suggestions were really claimed it would have been absurd to prevent the only class of men from contributing who have a thorough practical knowledge of the whole science of coal mining. If Messrs. Casey and Dixon are eligible because they have at some former time been working miners, how much more should a mining engineer be eligible, who has also been a practical miner, and worked his way through every part of the mine to the highest position, and I am glad to know several such mining engineers, and if they are allowed to compete why not all mining engineers?

I do not think that it can be pleasant for any of the competitors to have their names published now, the names of the judges, who have so generously accepted a very arduous task, are a sufficient guarantee that there is no foregone conclusion in favour of anyone.

In conclusion, I have again to state that I spent a good deal of time and some little money in preparing my essay, in the hope that, in the absence of real merit in any of the essays, mine might possibly entitle me to a prize, and I did so on the faith of the printed statement of the terms which was kindly sent in answer to an application which I sent to Mr. Hermon.

May 8. A RESIDENT COLLIERY MANAGER.

[The prizes offered by Mr. Hermon were distinctly stated to be for the best essay by working miners, or their agents, who, of course, were only colliers, and it was never intended that mining engineers should be allowed to compete. This was understood generally, for only one mining engineer sent in an essay. Of this we were informed some time since by a gentleman, who expressed his surprise "that an engineer, who was the manager of the pits of a very wealthy Duke, should not have considered it derogatory to enter the lists against working miners." "A Resident Colliery Engineer" will, no doubt, show to advantage when prizes are offered for essays by mining engineers only; but, in the present instance, if a prize were awarded to him it would be disputed most energetically by a great many of the essayists who are only miners."]

IRON MINING IN CORNWALL.

SIR,—As shipper of, perhaps, the best iron ore at present being produced in Cornwall, I should like to add a few words to what your correspondent "Vigilans" said as to the condition in which too much ore is sent out of the county. In January last I saw at Wadebridge a pile of stuff waiting shipment which, on a liberal estimate, did not, I believe, contain 40 per cent. of iron ore, properly so called, and probably not more than 25 per cent. of metallic iron. As a sale from a lot like this would be made on an analysis of a sample of good ore, it is not to be wondered at that smelters get disgusted with Cornish ores, and often decline to look at them, altogether in the belief that even if they take a cargo as a sample they will get nothing but rubbish which they cannot use. The mischief is that those who do ship well-conditioned ore have to suffer for those who don't, and find they have to pay for other people's want of knowledge or, it may be, carelessness. If Cornish ores were properly picked they would, as a rule, compete successfully with any ore that is produced, except, perhaps, the better grades of Cumberland ore, instead of, as is now the case, being looked upon with suspicion wherever they are offered, and it cannot be impressed too strongly on those interested to see that this matter is properly attended to.

To make iron mining in Cornwall a successful industry it is necessary that the ore should bring its very highest value, and this it will never do until by careful treatment of their produce those who have charge of the mines gain the confidence of the smelters.

Liverpool, May 14. ——— J. FLETCHER PAGEN.

NEW FIELDS OF IRON ORE IN NORTH DEVON.

SIR,—North Devon bids fair to play an important part in the immediate future in connection with the manufacture of Bessemer steel, if not even in respect of the iron trade generally. It has long been known that North, as well as South, Devon was very rich in mineral wealth, but it is only of late, and in a great measure owing to the construction of the Devon and Somerset Railway, that the exceeding richness of a portion of the district traversed by that railway became known. The line of railway referred to is one of about 40 miles in length, running almost due west from Taunton to Barnstaple, through a district that has heretofore been unfamiliar with the locomotive engine, one of the prime agents of modern civilisation. It is now rapidly approaching completion, and will soon be opened for traffic, the working of it being undertaken by the Bristol and Exeter Railway Company. When it is opened it will bring within the reach of the railway traveller a region that has hitherto been a sort of *terra incognita*, but which will henceforth be found to abound not only in mineral riches, but likewise in beautiful scenery, breezy upland moors, and charming ferny combes.

The new mining district of North Devon is chiefly embraced by the estate of Lord Poltimore, and lies about 10 miles to the east of Barnstaple, and in proximity to the village of North Molton, and between it and South Molton, which is the most important town in the district. That town is made one of the stations on the Devon and Somerset Railway, and seems not unlikely to bulk very largely henceforth in connection with the development of the mineral wealth in its vicinity.

At least three firms have obtained important mining concessions. First in order we must mention the Bampfylde Mining Company, who have for a number of years been working copper ore in their mines. They have now commenced to open up lodes of red hematite, in which both iron and manganese are very abundant. Adjoining the Bampfylde Mines, on the east, there is a concession of some 5000 acres, which has been secured by Messrs. Hawkins and Bush, of London. There are no fewer than three lodes of excellent red hematite being wrought by that firm at the Florence Mines, from which there is a tramway at present in course of construction to South Molton Station. On the west of the Bampfylde Mining Company's concession there is the Poltimore sett, which extends to about 2500 acres, and has been leased to Messrs. Granger Brothers, of Glasgow. What we are bound to consider as the most important feature of this new mining district is the discovery that has been made on the Poltimore sett, and to which we shall now direct special attention.

Messrs. Granger have also found, and have commenced to open up, lodes of rich manganiferous red hematite, but somewhat further to the west, and on the farm of Walscott, they have discovered white iron ore, or spathic carbonate of iron, running almost exactly in the same line as the lodes of red hematite. This mineral is exceedingly rich and pure. Some specimens from near the surface of the lode were found to contain a not inconsiderable quantity of silica, but others taken at a greater depth have rarely shown on analysis more than 3 or 4 per cent. of that substance.

So far as the essential constituents are concerned—protoxide of iron and protoxide of manganese—the Walscott spathose iron ore rivals many of the best qualities of that variety of ironstone that are worked, either at home or abroad. The following are the results of the analysis of two of the North Devon specimens:—

No. 1.—Protoxide of iron, 29·02 per cent.; protoxide of manganese, 23·37 per cent.; carbonic acid, 33·85 per cent.

No. 2.—Carbonate of iron, 55 per cent.; carbonate of manganese, 24 per cent.

As many of your readers are aware, the special value of a spathose ironstone is determined by the amount of protoxide (or carbonate)

of manganese which it contains, it being always understood that the mineral has no marked quantity of sulphur or phosphorus in its composition. So far as we can learn by reference to the published analyses of other spathic ironstones, there is only one that surpasses it in the amount of protoxide of manganese contained in it: we refer to that of Ehrenfriedersdorf, in Saxony, in which the compound is present to the extent of 25·31 per cent. It certainly outrivals the first specimen of the North Devon spathose ore, as it also surpasses in richness the famous spathic carbonates of Müsen in the district of Siegen, in Germany.

Such of our readers as have given attention to the Bessemer process of making cast-steel are also aware that this variety of iron-stone is of peculiar value in connection with the process, inasmuch as it is converted into spiegeleisen in the blast-furnace, to be afterwards employed in the carbonising process in the Bessemer converter. The richer it is in manganese in the form of carbide, the more valuable is the spiegeleisen to the manufacturer of steel by the Bessemer process. As the process has extended the makers have become more and more anxious regarding the supplies of spiegeleisen, inasmuch as, practically, the only source of supply upon which they have been able to place any dependence is that of the Siegen district; but even that district does not seem to be able to turn out more than 30,000 tons of the raw material per annum. Within recent years, owing to the great extension of the Bessemer steel industry, alike on the Continent, in England, and in the United States, the price of spiegel iron has advanced to an extraordinary height; indeed, within the last ten years it has risen from about 6*l.* to from 15*l.* to 16*l.* per ton, delivered free on board at Rotterdam. Hence, any new source of supply of spathose iron ore cannot fail to have a peculiar importance just now, especially when we consider that there are many new Bessemer furnaces building and nearly completed both in England and America. We are not unmindful of the fact that there occurs in the Brendon Hills, in Somersetshire, a deposit of rich spathose iron ore which, after being employed as an ordinary ore of iron, has of late been worked and used for the production of spiegel iron by the Ebbw Vale Iron and Steel Company. So far as we understand, however, it has been reserved for the exclusive use of the company, and the productions of ore is said not to exceed 50 tons per day.

The Walscott deposit of spathic iron ore, which has been secured by Messrs. Granger, seems to be a westward prolongation of the same lodes that occur in the Brendon Hills, 20 miles to the east. It crops out on the surface of a rising ground in such a manner as to give indications of having been worked at one time for manganese. When the workings were recently commenced the lode was found to be only about 2 feet wide, but it gradually increased in extent until it attained a width of 20 ft.; indeed, it increased so rapidly in size that operations were forthwith commenced for working the mineral by an open-cast. The ground has been proved for a distance of a quarter of a mile to the east of the spot where the first discovery was made, and at every opening the lode has shown itself. Large quantities of the ore are being turned out, so as to be ready for transit as soon as the new railway is open for traffic.

The mines of this new district lie nearly parallel with the railway, and at distances of from three to five miles from South Molton Station, where the ores will be trucked for dispatch either west or east. Owing to the natural conformation of the country, there are excellent facilities for the construction of tramways between the mines and the Devon and Somerset Railway; the mines, so far as they have been opened, lying in a natural valley, which has a gradual fall to the line of Railway. In connection with the shipment of ores from this new mining district, it may be mentioned that as the station at Barnstaple is nearly a mile from the harbour it is probable that Burnham, near Bridgewater, will be made the shipping port, in the first instance, at all events. It is expected that the Bristol and Exeter Railway Company will grant special rates to that port. We should mention that Burnham is opposite to and only about 14 miles from the port of Cardiff, where there is an excellent harbour, and where there are facilities for shipping to all parts of the world. Besides the lode of spathose iron ore near North Molton, the lessees have proved the existence of two lodes of red hematite, about 20 ft. in width, the mineral yielding on analysis—Peroxide of iron, 70·05 per cent.; peroxide of manganese, 16·73. This mineral is frequently very dark in colour, owing to the presence of black oxide of manganese.

M.

TIN DRESSING.

SIR,—I have had great difficulty in bringing myself to reply to the observations of your correspondent, "Mine Agent," because they are so contemptible in themselves as to carry their own refutation, but remembering that Capt. Parkyn, principally through me, had been the subject of such an undeserved and unmanly attack, I was induced to trouble you with a few words.

After carefully reading the letter in question, which appeared in the Supplement to last week's Journal, "I am led to conclude that if anything is at all clear from" it, "it is that" his epistle from beginning to end bristles with mean personalities, is utterly devoid of anything approaching a discussion upon any point connected with tin-dressing itself, that it is only a series of bombastic assertions, and that there was surely no necessity for "Mine Agent" to pause to inform us that his idea "of charity in respect thereof is a negative one."

"Mine Agent," in the early part of his letter, expresses his "surprise at the round of assumptions" which he professes to have found in the remarks of Capt. Parkyn, Mr. J. Walker, and "Plumbum Album," and his letter is an attempt to hurl a withering rebuke at us. But it is consoling, to me at any rate, to observe how that his hypocritical, empty, high-sounding missive is only an attempt after all, and that it rebounds upon his own pate with all its intended force. For he glaringly commits the crime with which he charges us. His letter is little else than "a round of assumptions." The most observable exception is where he says of himself, at the conclusion of an hypothetical proposition, "then I neither knew anything of the business nor anything of the literature of mining," which is highly probable, judging from his letter. "Mine Agent," avoiding to touch upon an item directly bearing upon the subject expressed by the phrase "tin-dressing," seems contented with parading his practical connection with mining for upwards of 40 years, his profound learning in the "literature of mining," his acquaintance with Bacon, and and a great deal more grandiloquence. But all this fails to serve him, so long as there shall remain any distinction between assertion and proof. He may confound them, but intelligent men do not. Take away the gratuitous assertions from "Mine Agent's" letter and nothing will remain. Where is the guarantee for the verity of his "round of assumptions?" I submit there is none whatever; and this fact, in the position which he has assumed, not only renders his assault harmless, but stigmatises his conduct with the darkest of colours in the sight of all those whose good opinion is worth having.

"Mine Agent" vaunts his mining experience, just as if the gentleman whom he asperses was a boy "employed in spalling ores for the stamps at North Roskear," or some other mine. But the fact is Capt. Parkyn went to the mine when only about 7 years old, and "since that period has advanced to the winning of ores, and thence onward to the giving of directions concerning the manner of mining and the arrangement and erection of stamps and other necessary appliances for the reduction and concentration of tin ore," and now is upwards of 40 years of age, and during all this time has made mining his only business. Where, then, is the ground for superiority which "Mine Agent" claims, by the position he has assumed, over Capt. Parkyn? Only in his own estimation of himself. "Mine Agent's" boldness to "rush where angels would fear to tread" may be regarded, I am inclined to think, as equalled by the weakness and meanness of the attempt.

Bear with me a little further, and permit me to add that the free and full discussion of any mining topic is to be courted rather than shunned. But when the limits of true discussion are flagrantly violated—when an individual of extensive mining experience who has given his name and address to the public under what he has published is fiercely assailed by one who hides himself as a snake in the grass—when the mere details and so-called "literature" of a subject are chiefly taken up and vaunted before general readers as if they were of primary importance—when age, experie nce, and position are gratuitously appropriated to give such a production authority—when the whole has for its only basis assertion, without a tittle of proof—when such characteristics as these meet in the production of any man, it is utterly unworthy of credit, and the author brands himself with very unenviable epithets. For a verdict on each and all of these I confidently appeal to the letter of "Mine Agent."

May 9. PLUMBUM ALBUM.

CAPTAIN PARKYN, AND TIN DRESSING.

SIR,—The efforts of the above gentleman look very much as if one had supposed he had driven in a nail and the other had clenched it; but the question now to be considered is, has it been driven in a good place, will it sustain its intended object? We shall see. The ebulition of Capt. Parkyn has very much the appearance of a storm in a tea-pot. His volubility seems to have outrun his reason; but how far it had to run to accomplish that I will not trust myself to conjecture. I dislike the importation of personalities into a discussion of this kind, and never resort to them except in retaliation. I was not aware that my former letter was an abusive one until so informed by "A Tin Mine Purser," and I am free to confess that I am not much enlightened by that information, but am rather in the position of "one convinced against his will, who holds the same opinion still." I do not intend on this occasion to criticise, much less censure, the efforts of Capt. Parkyn to improve tin-dressing, as he may or may not be able to achieve anything of much value in that line. My own candid opinion is that the pretensions of his plans are far in advance of their originality. I draw my inferences in part from facts furnished by himself, and if my conclusions are logically incorrect I am open to conviction; meanwhile, I hold to the views which seem most natural, and in accordance with truth. I am one of those who have long since declined to take anything for granted the facts and principles of which I am able to examine for myself; and when I find men rushing into print unguarded in their own statements, and reckless as to their endorsements of the statements of others, I have the most unquestionable right to the exercise of my own judgment in regard to any statements emanating from such quarters. As I divined in my last, the presumption of Capt. Parkyn, was and is, that the few antiquated modes of dressing to which he refers—in his own neighbourhood, it is presumed—are a fair specimen of what tin-dressing is throughout the county. This is evident from what he says about the feeding of buddles, as if the water were elsewhere allowed to flow over the slimes instead of having a distinct channel under them and a constant unobstructed flow into the buddles. It is many a long year since I was first acquainted with such a device and had it in operation.

Capt. Parkyn wishes to be informed what kind of floors they had somewhere in Cornwall, where 7000*l.* worth of tin was alleged to have been found under the boards. Let me see, 7000*l.* would represent 77 tons of 70 per cent. tin, and worth at present prices 90*l.* per ton. Does Capt. Parkyn mean to affirm upon the authority of any man that tin of that value had been allowed to leak between the boards of any mine in Cornwall? I can quite understand 7000*l.* being given for the halvans in a large defunct mine, as I see no reason why a great deal of tin should not have been thrown away at the surface as well as left standing in the lodes underground, whilst the said lodes were being worked for copper, and in ignorance that they contained tin.

Capt. Parkyn quotes Mr. Ennor as an authority regarding the quantity of tin said to be carried down the Red River. I need not ask Capt. Parkyn if he believes that statement of Mr. Ennor, as he has quoted him unqualifiedly as an authority, and thereby endorsed that outrageous statement. Mr. Ennor has stated, and Capt. Parkyn has accepted and endorsed the statement, that the sand upon the sea beach where the Red River empties itself into the sea is worth 1*l.* per ton. Now, the sand to be worth 1*l.* per ton must contain nearly 25 lbs. of tin to the ton of stuff. May I not ask Capt. Parkyn why he does not take his tin dressing-floors down to that part.? It ought to be a good investment, especially as they are making very handsome profits from some of the deep mines in the West, after paying very heavy expenses, from stuff not excessively in advance of that in point of quality. Take Carn Brea, for instance. Capt. Teague told the adventurers at their recent meeting that the average of the ores did not exceed 1¼ per cent., which percentage would find an equivalent in about 33½ lbs. of tin to the ton of stuff, and the profits of that mine during the last quarter were shown to have been 5000*l.* Further, Capt. Parkyn states that he has raised and returned ores containing only 4 lbs. or 5 lbs. of tin to the ton, but which of the two qualities he does not state, just as though a difference of 20 per cent. was of no moment as affecting the results, and that the cost of dressing 5 tons of black tin monthly did not exceed, including 4*l.* for the head dresser, 10*l.*, or 2*l.* per ton of black tin. Let me ask him does not this look like writing for Chinamen, or even for Hottentots, more than for the serious perusal of English mine adventurers, whom he pretends he is anxious to preserve from error? We will look a little further into this statement, in order to see what it is worth. If we take the stuff to which he has referred, and concerning which he has promised further particulars, at its maximum value of 5 lbs. of black tin to the ton of stuff, and assume that every particle of tin contained in it was saved—an utter impossibility, by-the-way—we shall find that the required quantity of raw stuff to make 1 ton of tin would amount to 488 tons, and for the monthly produce of 5 tons 2240 tons would be required, or upwards of 82 tons per day, to be reduced by multifarious buddling, racking, &c., to 5 lbs. of black tin per ton, and at a cost, including the head dresser's wages, of 7*s.* 5*d.* per day, particulars of which are promised for your current issue. This is an anomaly which, I think, the purser of a tin mine should blush at the remembrance of having so cordially endorsed all the days of his life. Capt. Parkyn's flourish about his not being afraid to meet me on any subject of mining, be it aboveground or underground, is sufficiently patent as to the source and incentive from which and by which it emanated—proceeding from a state and condition of intellect and experience which I am quite sure I have no earthly reason to envy. It is surprising that men assuming to be intelligent should take upon themselves to censure others and inform mankind aided by no better authority than the dictates of impulse. The brain, that essential organisation of thought, intelligence, and induction, seems never to be appealed to. It also appears that Capt. Parkyn takes Mr. Ennor as his model in writing, a fact—if fact it be—which does not say much in favour of his judgment or good taste. Is it necessary that he should be informed that that is a style which, happily, is now rapidly becoming antiquated, and will not long survive Mr. Ennor himself?

MINE AGENT.

PARKYN'S "SAVE-ALL" TIN DRESSING-FLOORS.

SIR,—In last week's Supplement to the *Mining Journal* I mentioned in my letter that I would, by your permission, send you particulars of a mine which yielded from 4 lbs. to 5 lbs. of tin to the ton of stuff at a shallow depth, and the monthly returns were about 5 tons of black tin. It was at the Royalton Mine, now Castle-an-Dinas. I was the first man who discovered this mine, and laid it out. It is a large tin-bearing elvan course, about 12 fms. wide, intersected by numerous veins or small branches of tin. The elvan is running east and west, and these veins or branches are crossing the elvan about north-east, and within 6 ft of the surface tin is found, and will average from the surface down 6 or 7 fms. below about 4 lbs. or 5 lbs. of tin to the ton, and below this to the 15 it was about 12 lbs. to the ton, and the engine-shaft was sunk to the 25, and these veins or branches increased in size and in richness so that the tinstuff was worth 25 lbs. to the ton. This was ascertained by an assay of a fair sample at the time I left the management. The 25 was driven west about 20 fms., and three stopes laid open; the 15 was also laid open both east and west of the engine-shaft, with the open stope 6 fms. below the surface, which supplied 5 tons of tin per month. Of course there was some sent up from the 25 and 15 in driving the levels, and the mine was well opened out in a miner-like manner, and if the same method had been carried out after I left as when there the returns would have soon been doubled; but some knowing ones said that more tin ought to have been raised, forgetting that the mine was paying 100*l.* a month profit, and at the same time laying open a mine of wealth. But, strange to say, within six months a new management was brought in, and the bottom level, which was the richest point, left to run or fall in, and also the 15, so that the mine was closed. But there are bright days yet for this mine when the new shaft is down, and if carried out properly, which I have no doubt it will be, a valuable mine will be found.

From one open pit west of the engine-shaft I took out 150 tons of tin, which yielded on an average from 4 to 5 lbs. of tin to the ton of tinstuff. Some months we raised over 5 tons of tin. It will be seen a large quantity must have been stamped to raise that amount, and the dressing-floors are now to be seen there, as published in the *Mining Journal* by me. Some people thought that as I was stamping such a large quantity, tin would be found beneath the floors, and a practical tin-dresser was sent below and tried what he could do, but after two or three weeks he left and said that there was not tin enough to keep a mouse, so that my "Save-All" answered its purpose well there. It is well known to many that tin is left to pass the floors in some mines which contain more than 4 or 5 lbs. of tin to the ton. I had to pay the cost of all the mine, and 100*l.* profit per month. My floors have been in operation ten years, and not, as "Mine Agent" says, sprung up all at once; and I say fearlessly that my plan will save all the tin, and not only so, but will reduce the labour 40 per cent., and in the erections a saving of at least 50 per cent., and that that I am prepared to alter or erect tin dressing-floors in any mine in Cornwall or Devon, and to meet any practical mine agent on the question, or to inspect and report upon any mine or mines, having had 30 years experience in hard and soft ground.

St. Austell, May 15. THOS. PARKYN.

NEW DOLCOATH MINE—THE NEW STAMPS.

SIR,—Who can account for the eccentricities of genius? Thus, Mr. Ennor's mode of proving that he "had seen quite enough of a thing" is to call to see it again; and, having first satisfied himself that it could not work, "he thought to have found it in full work." He "did not open the window to see it," thereby proving his genius in casting away all vulgar aids to knowledge, and sending you the very elaborate description of the machine and its power, &c., given in his last letter, without having even seen "the thing" he was describing and criticising. Being an eminently practical man, he takes great pains to ascertain the consumption of fuel and compare it with the work done; and, in order that he might have the greatest possible accuracy, and the highest authority for his statements on these points, he "*asked a man!*" Finally he goes away "thinking so little of Mr. Sturgeon or his engine" that he writes you an elaborate report upon the engine that he did not see, and which, therefore, being a "Practical," he was so well qualified to describe. With such an example as Mr. Ennor before us, who can doubt the great advantage of being "practical," which enables us to cast aside the ordinary aids to knowledge required by commonplace minds.

As to the first statement in Mr. Ennor's letter, it is simply and entirely an invention of his; and, I may add, the only kind of invention in which Mr. Ennor is likely to earn a reputation.

Bolton, May 14. J. STURGEON.

N. ENNOR'S REMARKS AND ADVICE TO YOUNG ASPIRANTS ON LEARNING NATURAL LAWS, AND WHO SHOULD BE THE MINE AGENTS—No. VIII.

Having already remarked on the men who should be on a committee upon Nature's laws, I can only say they are the most fit men to me, as the income of the majority of them is derived from the earth's sources, to which they have ever had a watchful eye as to her productive powers. Then, I have to impress upon them the necessity of aiding the young miner in his exploration of Nature. It is the only thing that can or will bring grist to the mill, or raise the produce of this land; and it is from these sources of produce that the merchant and the labourer earn their bread. This being the case, I am bound to go a little further, and ask them to become subscribers, not to pay these men wages (they should be self-supporting), but some bright youths among them, I may say, are pennyless through disabled friends, and have not sufficient to purchase even the few books, maps, and papers they require. I say raise a fund to aid them with these things; and, better still, a fund to present ten out of the forty who make the best progress with a handsome reward. I am sure that all Cornish gentlemen will concur with me in this; and I think there is not a landed lady in the county but would add her mite. Then, they have one other duty to perform, which is to frame good and very strict rules to work by, and to petition Parliament for an Act that none but five-years serviced youths, who have passed the committee, should be selected as agents. I have no doubt but that nearly every one of them would pass as efficient agents, and five or ten might be prize men. These men should sign all reports of new mines about to be opened. Mining companies under the present system are but too frequently got up to delude those ready and willing to invest in mining. Were there only honest laws to protect them they would be more ready to invest. I have been called on within the last week by parties who have a mine put into their hands to bring out. They asked me whether it is usual to charge 20,000*l.* for an old engine-house and shafts, exclusive of dues? I told them that it is not, neither do I believe the lord had sanctioned such a thing. I was called on by a second party, about to bring out a new mine, with no shafts in it: they propose a capital of 65,000*l.* Out of this the promoters and directors are to have 40,000*l.*, leaving only 25,000*l.* to work the mine. To work the mine 10,000*l.* is ample for all purposes. Some thousands have been paid in by men they have duped, and now fingered by the promoters, while the poor labourers have not been paid for many months. I mention these things to convince the lords that the whole power of having Cornish mines worked on an honest system lays with them. Not half the money collected to work mines is ever spent on them.

I openly say it it is time for the lords and adventurers to have trained and duly appointed agents for every mine. Every lord and adventurer will be benefited by it to an unknown extent. I say all the men who hang about, living apparently on their wits, are robbing the poor labouring man of his daily bread, and the lord and adventurers of their money.

Wadebridge, May 15. N. ENNOR.

YOUNG ASPIRANTS LEARNING NATURE'S LAWS.

SIR,—I am not surprised at "A. H." complaining of my late long remarks; you are aware that it was only a long, rough letter written when I was in London three months since, just to take extracts from. This, by some oversight during my absence in Wales, was sent on to you in place of my last Saturday's letter; still, I do not regret it; there is nothing in it but what I should most likely have added to had it come out weekly, as I intended. I am rather surprised at men of this class dictating as to the questions I should have put; I should imagine I had got to a very low ebb had I put his questions to any working boy; still, these are most of them questions which they are not able to answer. He touches upon the rudiments of mechanics, geology, mineralogy, and chemistry—all very good for mining men who have had actual practice, but it is really a useless thing for book-taught men—men who never go into a mine? What can such men know of the freaks of Nature, or of the earth's stratification, lodes, shifts, or elvans? It is a farce for such men to pretend to such things. I was coming out with a weekly letter on every portion of his remarks, but the misprint of that letter has thrown me out. I am now getting them up for a pamphlet, where I surely shall not forget them; in it I may put over fifty questions for them to answer with a view to show their real intrinsic value, as we have heard a deal of their wonderful discoveries and their own efficiency on these very named points. These are such as mystify me, as I never find one, nor even, after a hard day's run, get a glimpse of one. Where is the hiding-place of these extraordinary men? I say, further, to them, redeem your standing; go into every fair and market in the mining districts, and take the place of Cheap Jacks, get on the stage, and use the blow-pipe to instruct the mine boys, and prove even your efficiency in that; produce the metals there and then; we will let you slip by with your geological and chemical knowledge until you prove you are expert

in the former. I do not see any reason why, when in Cheap John's place (you being national-paid chemists), you should not give the farmer a few hints as to what is manure for his poor fields, and what it will cost. For my part, I should put but little confidence in what you say or do until you had shown me what gases you could pass through a heap in his poor fields, and make it good manure. All these pretended proficients that I have ever met are only to be compared to the figure 9 with the tail cut off, which becomes nought.

Wadebridge, May 14. N. ENNOR.

A "PROFESSIONAL'S" REPORT ON A MINE.

SIR,—A gentleman of my acquaintance who had taken a grant of an iron mining property, and respecting which he had received very favourable reports from practical miners, was desirous of selling it for a reasonable consideration. An offer was made to (and, I believe, accepted by) him, conditionally upon a certificate or report in its favour from a "Professor" in Mineralogy, who was sent down to view it—the fee for the view and a report being 100*l.*, so I was informed. The Professor went to the mine, accompanied by a miner, who, for 30 years had been conversant with iron mining. There are in the sett six or seven lodes. The miner first showed the Professor the most westerly lode, which consists principally of micaceous iron, but only slightly tested. Respecting this the Professor was reticent. The next lode shown contains red hematite ore, a parcel of which was lying near the opening on the lode. On looking at the ore, the following dialogue took place:—

Professor.—What do you call this?

Miner.—I call it red hematite. What do you call it?

Professor.—It looks as much like *manganese* as anything else.

Miner.—Manganese! I have been working on iron 30 years, and *I know* it is iron of good produce.

Professor.—Is this the best that you can show me?

Miner.—No, I have something much better than that.

Professor.—I will look at nothing more; it is a swindle!

The Professor then walked off without seeing the main lode, which is 25 feet, or more, in breadth. If he, by receiving the 100*l.* for a fair inspection, did not himself swindle his employer, I know not what to call it. It is not surprising, after this, to find the practical Mr. N. Ennor inveighing against "Professors."

Royal Hotel, Carnarvon, May 12. R. SYMONS.

THE PHILOSOPHY OF OPPOSITION.

SIR,—What would be the condition—nay, the very existence—of millions but for the improvements of the past century, and which were at their introduction steadily opposed? Railways, steam shipping, telegraphy, steam machinery, gas, canals, insurance, joint-stock, banking, cotton manufacture, mining, home industries, and the penny and halfpenny postage-stamps. Let us take a glimpse back to the time when all passengers were conveyed by stage coaches, goods by waggon, cities and towns were lighted by oil, houses by candles, while domestic fires were kindled through the aid of the tinder box and fulsome brimstone matches. Again, peace and order were in the hands of the old watchmen, foreign communication dependent on sailing ships, monied operations conducted by a few capitalists and private banks, and home correspondence by a ten-penny and fourteen-penny postage, with monopolies of every description crippling unaided and individual enterprise, taxes on salt, tea, sugar, and the luxuries of life, placing their use all beyond the power of the middle and wholly excluding the working and labouring classes. Let the reader compare the four inside and the twelve outside passengers of the "Quicksilver" Mail, taking 17 hours from London to Bristol, with the train, with unlimited passengers, performing the same journey in 2½ hours. Let him also contrast the departure and arrival of sailing vessels, "wind and water permitting," on a voyage of uncertain duration, with the daily communication between London and Paris, the weekly—nay, almost hourly—communication by steam and electricity between England and America, the regular intercourse between our favoured island and the remotest parts of India, China, and Australia, and he will be startled to realise that our trade could not be sustained to scarcely a tithe of its present volume if we were sent back to those days to which we refer, and in many instances our trade and commerce would become totally extinguished. In fact, supposing it were possible for some wonderful convulsion of nature or society to deprive us of the great means of communication that we now possess our wealth would greatly diminish, soon dwindle into comparative insignificance, and our prosperous millions, dependent on manufacture, trade, commerce, and constructive enterprise, become all but paupers.

The depreciation of steam-ships, steam-machinery, telegraphy, gas, penny postage, joint-stock companies, banking, finance, and co-operative companies would shake the very foundations of capital and labour, and inevitably lead to far more deplorable and lamentable results than ever has been experienced in the history of the world, and far greater in extent than has ever sprung from pestilence or war. The expansion in the use and application of coal and iron would become annihilated, and the home industries of the Mother Country smothered. But is the trade and commerce of the country sound and healthy, is enterprise fairly supported by capital, or is labour too exacting? Is the finance of the country based upon sound principles of existing and prospective soundness, or are the gigantic mediums of monetary transactions conducted by banking and finance institutions calculated to generate undue credit, and to exact from trade and manufacture a larger share of actual gains than the aid and accommodation they give entitle them to? These are grave considerations for the study of the disciple of the Science of Investments, and it is my intention in further letters to point out the "anomalies" not only at present existing in our interwoven system of mercantile business, but likewise to point out those of the past which have to a great extent been superseded, and, if possible, draw some practical deductions that may be useful to that class of your readers who are desirous of profitably investing capital.

London, May 14. R. TREDINNICK,
Consulting Mining Engineer.

MINING IN COLORADO.

SIR,—Notwithstanding the indifference, almost amounting to disfavour, into which Colorado mining speculation has fallen of late in England, I venture to bring the subject at this time before your readers. Compared with California, Nevada, Utah, and other western States and Territories, Colorado produces to-day the richest ores, both of gold and silver, which are sent to Swansea or Freiberg. I do not in this letter propose to enter into the reasons why the companies and associations, most of them unwieldy and possessing high-sounding titles, now operating in this and neighbouring counties, have ceased to be, or failed to become, dividend-paying investments. My object is chiefly to draw the attention of your readers to what appears to me the most remunerative field for small investments ever presented in any mining country, an avenue which will become closed in June, 1874, when the Amended United States Mining Act comes in force. In the interim between the present and that time locators and purchasers will be compelled to so improve their lodes (of which there are legion) sufficiently to entitle them to a United States patent, or they will become liable to forfeiture and re-entry.

Under these circumstances many persons who from poverty are unable to perform the requisite $500 worth of improvements thereon are offering an half-interest in their lodes as an inducement to capitalists to accomplish for them the necessary amount of work on the lodes to obtain their full title to the property. Many of these properties are, no doubt, of the most valuable character, within the richest belts of lodes, and, in all probability, would become paying investments.

I may here state that the Colorado Central, the Saco, and many other lodes of like celebrity at the present time, producing large quantities of very rich ore, could at a very recent date have been purchased on the above terms for a few hundred dollars, whilst these same properties could not to-day be obtained for as many hundred thousands.

It appears to me, as a miner of considerable practical experience both in England and the States, that this Territory exhibits in this direction both to the large and moderate capitalist an extraordinary opportunity for investment. For instance, by an expenditure of (say) 3000*l.* one-half interest in from 20 to 30 lodes could be obtained, a good percentage of which would, in all probability, prove to be valuable properties. Of course, it is presumed that in the selection of lodes upon which to operate the investor will be guided by persons of recognised probity and practical experience, who are thoroughly acquainted with the country.

I hope the present letter is sufficiently clear to enable your readers to comprehend my meaning, and the opportunity afforded them; but I shall be glad at any future time to furnish you with any additional information on this or like subjects.

DANIEL ROBERTS, Mining Engineer.

Georgetown, Clear Creek County, Colorado Territory, U.S. of America, April 9.

MR. PARK, AND THE EMMA MINE.

SIR,—"A Shareholder," in last week's Journal, has already dealt pretty freely with Mr. Park and his "explanations," but has omitted to direct attention to some of the most material points in that incongruous communication. For instance, Mr. Park says—"When I offered the property in London, the parties with whom I negociated required to have an examination and report of the mine by some competent and reliable man of their own selection, and they selected Prof. Silliman." This is, no doubt, perfectly true as far as it goes, but there are those now in London who, if they chose, could throw such additional light upon this matter as to compel one to come to the conclusion that the suppression of truth is suggestive of falsehood. Mr. Park says he "had no acquaintance with Prof. Silliman, had never seen him, and did not even suggest his name;" but Mr. Park, in another part of his letter, inadvertently remarks that he "represented others." Will Mr. Park affirm that the said "others" had "no acquaintance with Prof. Silliman?" Why does not Mr. Park tell us who paid Prof. Silliman for his report, and what amount he was paid? The value of his report is in the testimony of the Chairman, who accompanied Prof. Silliman in his second examination of the mine. The Chairman has emphatically and officially informed us that it is evident Prof. Silliman based his estimate of the value of ore in reserve upon that which had been removed by the vendors, which (said the Chairman) is manifestly a fallacy! So much for the value of that "reliable man"—Prof. Silliman.

"All sorts of stories were told and published about the mine for the purpose of depressing the stock," says Mr. Park, and "that the offer of 1*l.* per share for the sale of them at 40*l.* was made in a card he published in answer to a circular of Mr. Hiram Johnson—which card was issued from the office of the company with the knowledge of the directors, and they knew the motive!" This is one of the most glaring assertions in Mr. Park's letter, for while it is a definite charge against the directors it proves that this "motive known to the directors" was to advance the price of shares in the market, although, at the same time, the statements put forward by Mr. Hiram Johnson were absolutely founded on fact.

Where is Mr. Park's reply to Mr. Orr-Ewing's charge—levelled at somebody—that "it is very difficult to get men on the other side of the Atlantic not to yield to heavy temptations?" Is it an answer—for that appears to be the only one attempted—that the directors "could have informed Mr. Orr-Ewing that the resignations of Senator Steward and Mr. Park had always been at the disposition of the board whenever such resignations would have promoted the interests of the company, and that while they were directors they performed their whole duty?" The temptation is indeed great to Mr. Orr-Ewing to accept Mr. Park's friendly invitation to "cross the Atlantic and *learn more* of those he slanders; he may find there are gentlemen and honest and honourable men on this side of the water, and after he has left, and not able to defend himself we will not slander him and all his countrymen behind his back." Simple-minded people will think that Mr. Orr-Ewing may not be very anxious to "learn more" of these gentlemen, possibly having already learnt quite enough.

Mr. Park says he was accused at the meeting "of falsehood in stating that Mr. Willyams ordered 1000 shares of stock to be purchased after he had made an examination of the mine, and founds his statement on the fact that he does not find that number of shares transferred to Mr. Willyams on the books of the company." Mr. Park says that he "exhibited to members of the board at the time the cables from Mr. Willyams ordering the shares to be bought, and some of them knew the orders were fulfilled, and he now has the original cables, and will send them to London if necessary to answer this charge."

If this be the explanation, it is perfectly clear that Mr. Willyams, although a member of the board, was actually speculating in the shares. It is to be hoped he has profited by the operation.

The are many other points to refer to, but I reserve them for some future occasion.—*London, May* 13. A SHAREHOLDER.

THE EMMA SILVER MINING COMPANY.

We have been requested to publish the following letter, which has been addressed to Major-Gen. ROBERT C. SCHENCK, United States Minister, London:—

In the prospectus of the Emma Silver Mining Company (Limited), with a capital of 1,000,000*l.*, issued on Nov. 9, 1871, you not only lent your name, and the great influence and authority attached to your position as the representative of the United States in this country, to the company as a director, but your having done so was made a special point in the prospectus to inspire confidence in the minds of the British investing public as to the merits of the enterprise, and as a voucher for the correctness of the statements and estimates made, both in the prospectus itself and in the reports which accompanied it. As a director all the documents must have been issued with your approval and sanction, and when you subsequently, for State reasons, retired from the board the contents of your letter of withdrawal, dated Dec. 6, 1871, were made public, as further endorsing and vouching for the merits of the company.

In your prospectus you give as the estimate of the annual revenue to be derived from the mine the sum of 700,000*l.* sterling, and that, with a further expenditure of about 10,000*l.* for smelting works, the net yield of the mine would probably be increased to 800,000*l.* per annum. I am aware that the prospectus is not exactly worded as I have just put it, as the words, "at the rate of," "estimated net yield," are ingeniously inserted (probably without your considering the effect) to provide for some such contingency as has now occurred. All the calculations are, however, given in detail, and the figures above stated brought out in such a prominent manner that only one inference could be drawn by the public—that 700,000*l.* or 800,000*l.* would be about the revenue to be anticipated from the mine, for which subscriptions are asked on the credit principally of your name as the representative in Great Britain of the country in which the property existed, and having the best means of knowing its real value and prospects.

When it was suggested by some whose experience of American mining enterprises had not been altogether satisfactory, that the prospectus was wonderfully like that of some other American mines, which were kindly handed over to a too confiding British public upon somewhat similar terms (say, a 'year-and-a-half's purchase of estimated profits, as in your case), that the results would probably prove the same sooner or later—disaster and disgrace to the directors and ruin to the shareholders—doubters were silenced by the assertion that the Emma Mine was, as stated in the prospectus, an "exceptional" mine in every way, as you would not for a moment risk the credit and reputation of a great country upon any doubtful enterprise. All the more would you not do so in the case of the Emma Mine, considering the bad reputation of other enterprises of a similar nature, without your being thoroughly and completely sure as to the ground upon which you, as an eminent official personage, took your stand as an applicant for British capital. This line of argument was in many instances, as it has since proved, only too successful, especially with those whose limited capital made such a high rate of dividend, indicated by directors of such standing as likely to be obtained, an object of great importance.

The Emma Mine was only "exceptional," it appears, in the way of having your name to raise even a larger sum than is usual for such enterprise, and the British investor has once more found that Americans, even if represented by their ambassador, are only generous on paper when disposing of their mining property. They are, at all events in this case, just before they are generous, as they have involved, in the first instance, the reputation of their country in deluding the confiding English goose. It is, however, now to be hoped that they have succeeded in killing the goose that laid for them golden eggs, and we shall have, I trust, no more American mines sold to us upon calculations deduced from the amount of ore which has already been extracted. If it was not so serious and so sad for many it would be ludicrous if we could only realise what asses we are. A mine is worked out (or nearly so), and sold to us upon estimates based upon what has been already got from it! The conjuror* now says, "There is no deception, gentlemen, I assure you; here is the Emma prospectus—the calculations—and where is your money?" Echo answers, "Where?"

The Emma Mine has 1420 tons of reserve pay ore left, and Mr. Attwood says, in his letter of March 30, "After having carefully examined the mine day after day I find nothing to alter the opinion I expressed to you on the 25th inst. (making reserve 1420 tons), and am using every effort to push forward the new work, and also to try to find some new place in which I think men could be put to work with some chance of finding new deposits of ore."

Shareholders now see the nominal market value of the property they invested in, upon the faith of your prospectus and reports, at one-third of the amount they subscribed for it; and the income, which was indicated at 700,000*l.* (if it had been even 50 per cent. less I would not have addressed you), has proved only about one tenth of this sum, and even this wretched result is obtained at the almost complete exhaustion of the mine. Dividends "gone;" reserves of first class ore 13,250 tons valued in your prospectus at 358,750*l.*, "gone;" reserve of second-class ore, valued in 1871 at 64,000*l.*, and found in 1872 perfectly unrealisable, may also be considered "gone;" "extent of ore unknown," "gone" into limestone where tried; and the mine, further, heavily in debt!

Alas, poor shareholders! What bitter irony for you to indicate to them 700,000*l.* per annum, and lead them into their present position by reports and statements by which they were the more readily misled, when, as it were, sanctioned and confirmed by the weight of your great official position, added to the weight of the names of the other gentlemen on the board. Against your personal honour I have not one word to say, nor do I believe will the most indignant shareholder venture to do so, as you doubtless believed in all the statements and reports put forth; but it was both a misfortune and a fault that, in your official capacity as United States Minister in this country, you should have misled, and so completely deceived, many poor unfortunate people who placed implicit reliance on all that came from an American Minister. I can hardly believe that you know the true position into which the mine has drifted; and it is partly with the view that you should at once lend your powerful aid in the States to save the remains of the property from the clutches of those in whom no confidence can be placed and no mercy expected, that I now address you. To do this, and to substantiate the truth of what I have alleged in this letter, so that there may be no misunderstanding, I will more fully compare the statements of the prospectus with the results.

1.—The ore has cost in getting upwards of five times the amount indicated in the prospectus, and has enormously fallen off in value.

2.—The total estimated net yield of ore as per the prospectus was 700,000*l.* per annum, whereas the actual net yield for fourteen months, less one week, was 86,40*l.*

For one year (say)	£ 71,059
Or about one-tenth of prospectus estimate.	
Deducting, however, from the 86,40*l.* London expenses 12,24*l.*, there is for the fourteen months a balance of	79,262
Or for twelve months (say)	68,500
As against net results promised	700,000
Being short	636,500

The dividend actually earned would, therefore, by the company's accounts, appear to be at the rate of 6¼ per cent. per annum, instead of 70 per cent. estimated; but, according to the latest reports received, even this small amount, as already stated, has been earned at the cost of the almost complete exhaustion of the proved portions of the mine. The extent of ore unknown and unproved has since principally been proved to be limestone. Mr. Attwood, in his report, estimates practically the whole available reserves of the mine at 1150 tons of pay ore, worth at the mines about 13*l.* per ton, but the cost of extraction of which, with the small output of 30 tons per day, the heavy expenses of timbering and exploring, will barely cover the current working charges of the mine. Even the 6¼ per cent., therefore, has not been earned, but has been really taken from capital which, as far as the mine is concerned, unless a new discovery is made, may now be taken to be wholly lost.

That the mine is in debt will be most clearly shown by the following balance-sheet, drawn as for March 1:—

THE EMMA MINING COMPANY (Limited).

Probable balance sheet as on May 1, 1873.

Dr. Dec. 31, 1872.		Cr.	
To T. W. Park	£33,848	By product of mine since Dec. 31, 1872	Nil.
Income tax	2,000	Net surplus value of 1420 tons actual reserve, as per Mr. Attwood's report	£ 7,150
Illinois Tunnel Company	1,575	Sundries, as per balance-sheet, 26,000*l.*, and which might realise	20,000
Ditto ditto	17,000	Balance	50,960
Sundry creditors	389		
Deficiency in mine accounts for four months (say)	10,000		
London expenses (say)	2,000		
Law expenses owing	3,424		
Deficiency in dividend account, Dec. 31, 1873	7,874		
Total	£78,110	Total	£78,110
To balance, being debt due by the mine March 31, 1873	£50,960	Cr. Per contra. Value of mine	Nil.

"There is also on hand the second-class ore on the dump, valued by Professor Silliman in 1871 at 64,000*l.*, and since increased in quantity." Meantime no credit can be given for this, as during the whole of 1872 it could not be sold or realised, and the company does not include the amount in its assets. Not only, therefore, has the whole value of the mine disappeared, but, allowing the full values claimed by the company in their balance sheet for sundries, there is an actual apparent deficiency of 50,960*l.*

The debt due to Mr. Park and to the Illinois Tunnel Company amounts to upwards of 50,000*l.*, and it is to the protection of the mine from seizure on the part of Mr. Park that I would beg your prompt and earnest attention. Mr. Park has practically been forcibly removed from the board, and Mr. A. Orr Ewing, by whom he was replaced, spoke of him in very severe terms. As to the wisdom of Mr. Ewing, as a director of the Emma Company—with no unpaid capital to fall back upon, and with a mine practically exhausted, and all earnings expended in the last hope of finding another pocket—making such remarks to a large cash creditor is quite another matter; but he did make them, and Mr. Park may be led to take steps to seize the property, and thus throw away for the company the last chance of making a further discovery for their own benefit.

Mr. Park is, doubtless, a friend of yours, and I trust you will use your influence to get an assurance from him that he will use no undue pressure. This would be the very least Mr. Park can do after obtaining such an excessive sum for his mine; but what confidence are the English shareholders justified in putting in Mr. Park? None. They have grounds, however, for appealing to you to help them in their extremity, and they do so, hoping and believing you will do your utmost to serve the company which you so unfortunately fathered.

If the mine, sold to us for 1,000,000*l.* sterling, should be seized by the vendor for a claim of 33,000*l.*, I need hardly say what the feeling of the British public will be, and how much further you will be compromised. If you are still a shareholder, in further corroboration of all I have stated I beg you to compare carefully Mr. Silliman's reports with Mr. Attwood's facts, and the balance-sheet with your prospectus. These will speak for themselves to you and to every shareholder. Bad as our position is do not let it, by confiscation, be rendered utterly hopeless as regards obtaining any help from the mine, as, carefully as the prospectus is drawn up, a despairing effort would undoubtedly be made to hold the first directors legally liable for what they are undoubtedly at the present moment morally responsible.

Arthur-street, W., May 12. AN ORIGINAL EMMA SHAREHOLDER.

* See Mr. Park's letter, dated April 12, 1873, to the Emma Mining Company.

THE "MINING BUREAU" IN LONDON.

SIR,—I beg to inform you of my departure to-day for America, having been requested by some leading mining companies to proceed at once to the Pacific States, and report upon several valuable mining properties. I shall return to England about the end of July next. During my absence Messrs. Bennett, of 71, Cornhill, E.C., have been appointed general agents of the Mining Bureau in London, and as such are authorised to receive orders for examination of mines in the Pacific States, to be transmitted to me by telegraph, while on my way to the Pacific Coast. J. BERTON,

Vice Consul of France, President of Mining Bureau.

London Office of the Mining Bureau of the Pacific Coast, May 14.

MINING IN SOUTH AUSTRALIA—THE KURILLA MINE.

SIR,—I am glad to observe that the tenor of the reports by this mail of what is doing at the mines of South Australia is more promising than ever for the prosperity of that colony. I begin to have great hope now that the Yorke Peninsula Mining Company's Kurilla Mine will shortly prove to be a prize worth possessing. I believe, indeed, that result would have been attained some time ago if they had not been prevented by some legal technicalities from taking the necessary steps to obtain and expend capital adequate to develope it expeditiously and more completely. The directors, however, deserve much credit for the steady, economical, and persevering way in which they have stuck to their task with the limited resources at their command. The Kurilla, as is well known, lies between the Wallaroo on the north, and the Doora and the Moonta Mines on the south; and the Devon Consols, again, is on the section which immediately adjoins that on which the Kurilla is situate, and appears to be rapidly affording good evidence that it is being developed into another great mine. The latter, too, is working eastward on the lode, while the former is working westward. I am strongly inclined to think, therefore, that my expectation of its success also at no distant day is not an unduly sanguine one. At all events, I intend in this matter to be guided by the maxim lately enunciated by our Premier, in quite another line of business, and "consider once, twice, and three times" ere I part with my interest in the Kurilla.—*May* 15. SENEX.

WHEAL BARNARD SILVER, TIN, AND COPPER MINE (LATE THE QUEEN).

SIR,—As a rule, the greatest successes in life are fraught with a legion of difficulties before the real triumph is attained. The above mine has been far from an exception; but, apart from one of the richest courses of silver ever discovered in England, which permits the mine to speak for itself, although I confess it may suddenly vanish as a dream, or, on the other hand, return 50,000*l.* worth of silver in a few weeks, permit me to inform the world that we are now taking out 20 ozs. of silver per day from the burrows, or rubbish heaps. With the present high prices of materials and labour, one and all are ready to admit that mining is under a heavy cloud, and it is in these days of depression that the pursuit of mining is required to be made less speculative. To this end I have, with a few others, been fighting most desperately, and using my best endeavours for the past twelve months. The results can be seen by any half-a-dozen practical men paying the mine a visit, and I shall be happy to see their opinions expressed, good, bad, or indifferent, in your most impartial Journal. The prospectus of the company is brief, but of sufficient length to describe the secret of successful mining; and I presume your readers will permit a mine to be entitled a success which put to work in the morning upon rubbish heaps makes returns and profits in the evening of the same day.

It is far from my desire to extol the merits of Wheal Barnard to the depreciation of other properties; the mine, save for its slice of luck in having rich silver, is, perhaps, no better than its neighbours; in fact, the Prince of Wales contains hundreds of thousands ounces of silver in low-class stuff. As the whole of the lodes will average or concentrate to 20 ozs. per ton, lay out 1000*l.* upon calcining furnaces

and the requisite plant, and 20*l.* per day clear profit could be made with the greatest ease.

A few weeks since, at a certain mine not many miles from Tavistock, it was elicited that copper ore sold for some 800*l.* was worth about the same for tin, when suggestions were made as to the policy of securing the tin before disposing of the copper, but overruled upon the advice of some of the old school that between two stools they might fall to the ground, as, in saving the tin, one-half or more of the copper would be washed away. Perhaps the shareholders may be surprised to hear that the ore contained 14 ozs. silver per ton, in a word, the mineral was sold for one-third its real value, and yet how simple to convert the silver and copper into chlorides, dissolve them in hot brine, and then extract the silver and, afterwards, the copper as precipitate, worth 50*l.* per ton. As regards the tin, every tin-dresser can form some opinion as to the good cleansing results upon oxide of tin after being roasted with salt, and boiling brine passed through it. I am very busy, and have no time to go further into explanations, but the whole can be seen practically at work at Wheal Barnard.

I have one request to make, that no absurd eulogies will be showered upon me for success, as I shall just treat them with the same contempt and indifference as I have always displayed for the abuse hurled after me for defeat in the past, when my best energies were then, every whit as much as now, devoted to the welfare of mining.—*Abbey Mount, Tavistock, May* 15. THOS. J. BARNARD.

TERRAS MINE.

SIR,—The utterer of a scandal is never more contemptible than when, shrinking from the mention of a name he nevertheless points at the person he refers to. The "broker in Gracechurch-street" is, I find, the only one in it who advises upon investment in mineral property; and he, let the lode-creating Mr. R. Symons be well assured, is thoroughly in lependent of either his envy or malevolence. Passing by the writer of the marvellously lost letter of the 30th ult., so far as that ingenious fiction is involved, and casting aside his spurious attemps at criticism, I will just glance at the allusions he is so fond of making to the "equity of the Divine command"—that everyone should love his neighbour as himself. All this I grant upon the principle of human charity; but it may not, after all, be either convenient or discreet for a person to share, on demand, his purse with another in whose grateful integrity he does not hold implicit confidence; and in this assertion of prudence I unmask the battery from which the rancour of Mr. R. Symons has been so ruthlessly levelled at the Gracechurch-street broker.

Once upon a day, on or about six months ago, an individual, not a miner but a magpist, entered certain offices and, after the usual salutations, asked for a loan of 5*l.*—five pounds sterling—a favour which was frankly but courteously refused. However, no doubt according to the equity-loving applicant's notion, no *neighbour* could stand that: it was, in his opinion, not in consonance with his interpretation of the Divine precept, and the doers of things so illiberal should forthwith suffer for such flagrant iniquities towards him, at all events. Eolus pent up the winds, but he would not his wrath—the cockatrice egg was hatched in his heart—he mentally sounded a note of defiance on his penny trumpet, and hence the assault now being made on the before-mentioned broker's stronghold. Now, this perspicuous truth surely cannot be unacceptable to such a lover of veracity as Mr. R. Symons, who is personally aware that it is the truth, and nothing but the truth.

Leaving this state of siege, with its showers of ill-factured paper pellets, to fare as it will, I will say curtly of Terras that the advocacy of that mine was founded solely on material personal confidence in the undertaking, and never at variance with the official and recognised representations of the management, so that from a mining as well as a market point of view that advocacy is morally defensible. With regard to the antecedents of being underground, &c., boasted of by Mr. Symons, we all know his own fatuitous confidence in himself, but I venture to say that there are few who know him would practically share his delusion. At the same time I heartily join with him in his contrite declaration, for it will be a great ease to his conscience that for the future he will subjoin to his plans the note:—"I do not hold myself responsible for the number or accuracy of the lodes delineated in this plan—R. SYMONS."

Allowing, in reverence to humanity, Mr. Symons's ancestors, of whom, unfortunately, there is no record, to sleep in peace, I pass on to his sympathetic reference to the abolition of imprisonment for debt, and the convenience the Act has been to brokers. It is so, for I have known instances where some of them without a shilling of personal debts suffered durance under the old law merely for liabilities imposed by that most nefarious of all nefarious institutions—the Cost-book System. Apropos to that, the broker in Gracechurch-street is wont in his advertisements to warn his clients to shun the Cost-book System as they would a serpent.

Finally, Sir, having reached this point, I turn from Mr. R. Symons's ribald reference to those scriptural names that give the conclusion of his letter a very equivocal character. In no implacable spirit, I advise him in his future dealings with others to beware, and not to stumble on his way. JAPHET.

THE ROUND OLD WORLD.

SIR,—In the first place permit the exclamatory query "*What's in a* Name?" Owing to an ordinary printer's error, an *a* instead of an E was set in the disputed name, and, further, as I contend it was originally written *Japhet*, I make a present of the final *t* to the "conventional penny trumpet, and to the shrill *piccolo*, the halfpenny tin whistle, that acts as his accompaniment if not his identity."

"J. B." relates with puerile simplicity his infantile notion that the surface of the earth was flat, and his fear that, did he go too far, he would fall over the edge—he could not tell how far. Well, all I can say is, that had he fallen only to half the depth of the obscurity of his literary performance he could not have defiled a leading Journal, the representative of our oldest national industry, with his unmitigated rubbish. JAPHET.

SUGGESTIONS TO CORRESPONDENTS—PERSONALITIES.

SIR,—Being a constant reader of your Journal I was sorry to see so much valuable space in your last week's issue occupied by such letters as those signed "R. Symons" and "J. B." The writer of the former, I presume, wishes to make a display of his writing powers, with the vain idea that he is appreciated by your readers. As regards "J. B." I fail to see the point in his epistle. Paper warfare often reminds one of the French fable of "The Two Coachmen," who, meeting in a narrow lane, instead of giving way, sat and blackguarded each other, and thus stopped the traffic. I don't wish to insinuate that either "R. Symons" or "J. B." is a coachman, but only to draw the comparison. The sole credit due to either is that they appear conversant with the Scriptures. I should suggest to Mr. R. Symons that if he wishes to continue to parade his letters before the world he should avoid personalities and all statements due to ill feeling only. I trust that, in future, parties writing to your paper will do it in the interests of truth, science, and mining. A. F.

WHEAL VINCENT.

SIR,—Some person, who styled himself "A Mine Agent," took the liberty of writing a letter respecting this mine in last week's Journal. It purported to be a reply to a letter written in the previous week by Mr. J. Deeble. "Mine Agent" called in question certain statements made by J. Deeble. He asks "Is it not more than 12 months since Mr. Deeble assisted in removing the materials?" I reply that he was engaged removing the materials until June 15, 1872. The engine was moved by Mr. Mathews on July 9, but did not get fairly to work until August. The first sale of tin was made on Oct. 22; 27 tons 8 cwts. 1 qr. 27 lbs. has been sold, and realised 2070*l.* 19*s.* Nearly 10 tons of tin is ready for another sale. It is not the wish of the shareholders that anyone should attempt to puff the mine, and I should not have troubled you with this communication but for the evident malice of "Mine Agent," who, without any cause whatever, according to my thinking, concludes his letter with the following caution:—"I quite agree with a local paper that there are a lot of paper mines requiring weeding out; the wonder is that capitalists do not obtain better advice ere they throw away their money." If I am on the right scent "Mine Agent" is a disappointed man, and would much like to represent such a mine if he had the chance. To my own knowledge large numbers of the present shareholders have taken the best advice they can get, and I do not think they will be panic struck by the ill-natured remarks of "A Mine Agent."

THE PURSER.

WHEAL VINCENT TIN MINE (ALTARNUN).

SIR,—In last week's Journal a letter appeared relative to Wheal Vincent Mine, signed by "Mine Agent," in which the writer attempted to contradict some statements made by Mr. Deeble in reference to this mine in your previous week's issue. I think, Sir, it does not require a large amount of discrimination to discover that "Mine Agent" was actuated by feelings of prejudice when he sat down to write his letter, and I think it is evident from the tenor of his composition that he wishes to speak disparagingly of the mine, as he calls into question the statements made by Mr. Deeble (although he cannot contradict them), and he finishes up by saying "there are a lot of paper mines which require weeding out," evidently intimating that he considers Wheal Vincent to be one of that class.

Now, Sir, allow me to say that I consider it to be quite immaterial whether Wheal Vincent be situated five miles north or south of the "celebrated Phœnix Mines," or whether the engine was bought at Wheal Mary Louisa or elsewhere, or whether they are sinking on No. 3 or 4 lode. It is, however, quite true, as stated by Mr. Deeble, that the engine-shaft is being sunk, by nine men, at 24*l.* per fm. Another statement made by Mr. Deeble, and which I consider the most important one, was not alluded to in "Mine Agent's" letter, and that is the quantity of tin returned and sold. During the short time the mine has been at work I think, Sir, you will scarcely find a similar case in the whole annals of mining history, and it clearly proves that Wheal Vincent is not one of those paper mines, as "Mine Agent" insinuates, but that it is a mine possessing well-defined and tin-producing lodes, which only require to be a little further developed to fully establish the reputation of the mine on a firm and permanent basis, and to make it a source of profit to those who have been fortunate enough to become shareholders.

If, Sir, "Mine Agent" should be one of those unfortunate individuals who were some time ago connected with the mine, but whom the committee of management thought fit to discharge, allow me to say that, notwithstanding his feelings of envy and prejudice, and despite all he may do and say to try to lower the mine in the estimation of the public, all his efforts will prove unavailing, for I believe that ere long Wheal Vincent will be in such a position as to lift it above the voice of calumny, and to render it second to no young dividend-paying mine in the county.

In order, Sir, that you may see I have some grounds for the opinion which I now submit, allow me to state the reasons by which I think I am fully warranted in coming to this conclusion. I have been connected with the mine from its commencement, now little more than 15 months ago; and having a practical knowledge of mining in all its various branches I am, I think, in a position to judge of the present and future prospects of Wheal Vincent. The engine shaft is sunk 27 fathoms from surface, and is progressing favourable, and the lode improving in size and value in depth (I might state here that it is No. 3 lode). We have also four other lodes traversing the sett, one of which has already been laid open, and is very rich for tin, and when operations are resumed on this lode the returns of tin will be materially increased. No. 2 lode, commonly called the streamers' rich lode, will, we hope, be intersected in about two or three weeks from this date. I have already referred to the quantity of tin returned during the short time the mine has been working, and there will be 10 tons more ready in about a fortnight, a fact, I think, which speaks volumes in favour of the mine. We have 32 heads of stamps already working, which can easily return 7 tons of tin per month, and the cost of the mine for the same period would be less than 400*l.*, which would leave a small balance in favour of the adventurers. And when the lode has been driven on in the 20, and stamping facilities increased, we shall be able to return a much larger quantity of tin without incurring much extra expense. Our present engine is calculated to put the shaft down to the 50, and when this point has been reached, if the lodes continue so well as at present, we shall then have a tin mine second to none in Cornwall.

In conclusion, I would say that it is highly essential to the prosperity of the mine that the shareholders should see that it is economically and properly managed, and if this point is gained there can, I think, be no doubt but they will be well remunerated for any outlay they may have made in placing the mine in its present position. A SHAREHOLDER.

WHEAL VINCENT MINES (ALTARNUN).

SIR,—I feel much obliged for your inserting my letter of April 23, and was not a little surprised that it should draw a reply from anyone, especially from one who is evidently ignorant about the mine and its situation, and has the temerity to sign himself "Mine Agent," for I am confident no mine agent would venture such a frivolous reply.—1. He says, "It might be five miles north, but not west of the mines spoken of." Allow me to tell him he ought to know this is impossible, as the stratum of granite, in which all the mines I mentioned are, runs east and west through the county, and in this neighbourhood only varies from one to three miles in width. Further, Trewint Torr, which adjoins Vincent, can be seen from the heights of Kitt Hill, and by observation proves to be south of west, with Phœnix and Caradon Mines in parallel line, hence the impossibility of its being north instead of west.—2. Your correspondent says "it was eight instead of seven weeks as stated by me since the last batch of tin was sold." Now, I still assert it was seven weeks only, to the date of my letter of course; tin sold March 5.—3. "That a shaft was not sinking on No. 4 lode." It is true I have not been on the mine since the general meeting, but previous to that the shaft was sinking, and pitwork, &c., all fixed, and at the meeting the agent strongly advised the vigorous sinking of this shaft, which was adopted, and if it is temporarily stopped by them for some purpose we may well suppose it will be started again as soon as possible.—4. He says, "it is not yet decided to drive a cross-cut from No. 3 lode (engine-shaft) to cut No. 2, or Streamer's rich lode." Allow me to say confidently that they have driven already a cross-cut from the 10 towards this lode 11 fms. 3 ft., but could not well go further, because of the decomposed state of the granite and so much water. Since that they have started at the 20, and have driven 2 fms. I should judge by this they surely had decided the matter.—5. "Mine Agent" says, "and it is not a month since I was at Mary Louisa Mine about the materials," &c. This I leave to your judgment. I went there on Feb. 22, 1872, and finished the work of the engine, &c., and sent it on in six weeks. I was rather at a loss to understand the object of "Mine Agent" replying to my letter before I saw about the rich mine from whence the materials were bought. I fancied then he was like the man laying down sweet treacle plasters to catch flies with. JOHN DEEBLE.

Harrow Barrow, May 16.

FRANK MILLS MINE.

SIR,—Before me is a copy of the notice of a Bill in Parliament for authorising the Teign Valley Railway Company to make arrangements with the Great Western, the Bristol and Exeter, and the South Devon Railway Companies for amalgamation and other purposes; or, in other words, the railway is coming close by this mine. The effects of this piece of good luck cannot be over estimated, for the iron ore now found and ready for carriage can be at once conveyed to the markets. It may not be generally known that the mine is on the point of paying its own expenses, ere a question is raised as to the white iron ore. It is considered in Exeter to be one of the best channels of investment now on the list of promising concerns. I herewith enclosed an analysis of the spathose iron ore by Dr. H. M. Noad, of St. George's Hospital, London, and we have:—

Carbonate of iron	68·53
Carbonate of manganese	14·40
Carbonate of lime	6·48
Carbonate of magnesia	7·40
Sulphide of lead	1·80
Silica	1·20—99·81
Iron in raw ore	38·26
Iron in roasted ore	54·7

Hence we now find that the unlimited masses of iron ore can be worked at a very large profit. With these facts staring us in the face, undeniable, and not to be contradicted, I should be obliged to any speculator to point out to me a more magnificent property than Frank Mills at the present quotation. Having under 5000*l.* through forfeiture of shares, Frank Mills stands alone unequalled in prospects for the future.—*Bristol, May* 14. OBSERVER.

[For remainder of Original Correspondence see to-day's Journal.]

Meetings of Public Companies.

VANCOUVER COAL, MINING, AND LEAD COMPANY.

The annual general meeting of shareholders was held at the Cannon-street Hotel, on Tuesday,—Mr. GALSWORTHY in the chair.

Mr. S. M. ROBINS (the secretary) having read the notice convening the meeting.

The report of the directors (which appeared last week) was taken as read.

The CHAIRMAN, having apologised for the absence of the Hon. Mr. Fitzwilliam, M.P., the Chairman of the company, stated that it was reasonable to suppose that as the price of coal has improved in this country it will react in Vancouver Island. As to the division of the available balance he thought they had shown sufficient reason in the report why it should not be done, but why it should be carried forward to the next account. They had some little difficulties, such as the influx of water, which had rendered it prudent that they should refrain from dividing that balance until they saw the results of the present half-year. Having that in hand, they would be able to increase the dividend at some future time, if the shareholders would be satisfied for the present with a 10 per cent. dividend. The great object of the directors had been to keep the dividend at not a lower rate than 10 per cent., and now having got over some of their difficulties he saw no reason why they should not succeed in this. It was far better to pay regular dividends than sensational ones for twelve months, and perhaps nothing at all the next. That is the policy of the board, although some of the members are in favour of dividing up to the hilt. Referring to the different properties of the company, he stated that the board had come to the conclusion that the Newcastle property is not merely what they expected, but that from ascertained facts it is a very capital mine. He thought the future of the company will be greatly enhanced by the proved value of the property, because beyond the fact that they will be able to work it at a much less cost than the mine on the mainland, the coal is of better quality. They had designated it the Fitzwilliam Mine. They had a staff of efficient officers on the spot in Mr. Bate and Mr. Bryden, the joint managers, and he thought the thanks of the company should be conveyed to them. At San Francisco they are fortunate in having the assistance of a gentleman of considerable influence—Mr. Rosenfield—one material point being that he is very prompt in remitting money to the board. He also, on the part of the directors, wished to call attention to the secretary, who carries out the duties of his office with the utmost efficiency, and he thought they had been rather remiss in not having acknowledged those services upon previous occasions. During his long experience with companies he had never known a secretary display so much zeal and hearty interest in the affairs of a company as Mr. Robins, and it would be only proper to-day to give him a vote of thanks, especially for the zeal and attention he has displayed ever since he has been connected with the company, and more especially since he has been acting as secretary. Satisfactory arrangements had been made with a Mr. Bell, who is now on his way to Vancouver to aid in advising as to the most approved plan for opening out the Fitzwilliam Mine. This important end will be attained at a very trifling cost, while the opinion and advice of a competent man will be obtained. The coal won on the mainland is 250,000 tons; in the old Newcastle Mine, 100,000 tons; and in the new mine (Fitzwilliam), 900,000—that is, for the 500 yards in the slope; but they are now under a contract to sink 200 yards deeper, which will give them 1,260,000 tons, subject to deductions for "pillars" to keep up the mine. The coal thus won will be 820,000 tons. Advantageously situated for economic working, he was not without hopes they would be able to get the coal from the Fitzwilliam Mine for something like 8*2* per ton instead of 8*3* or 8*4*, which had been the cost on the mainland. Assuming that they will be able to get good coal at such a greatly reduced price, they will be better able to compete with Australia and other places. Although for the present they had been overtaken with difficulties still he thought the prospects are good, and that before the end of the year the position of the company will be very much better than at any previous period. As to the return of the capital, looking at what is going on, the directors think it will not be desirable to deal with that until they had such surplus funds as to make its return a necessity. He then moved that the report and balance-sheet be received and adopted.

Mr. FRY seconded the proposition.

Mr. TENDRON approved the policy of the board in not increasing the dividend, and also in not returning any proportion of the capital. There is no doubt the company possesses a good property, that had given good dividends in the past, and will give better in the future.

The report and balance sheet were received and adopted, and a dividend for the half year, at the rate of 10 per cent. per annum (free of income tax), was declared.

Upon the proposition of Col. HUNTER, seconded by Admiral STODDART, the retiring directors were re-elected, and the auditors were re-elected.

Mr. TENDRON moved that, in consideration of the very valuable and zealous services rendered by the secretary for many years, a gratuity be presented to him of 50 guineas, and that his salary be raised from the commencement of the present year to the sum of 400*l.* per annum.

The CHAIRMAN could not, as a member of the board, second that proposition. He was glad the suggestion had been made, because it relieved the directors from making a similar proposal, which they intended to do. The amount just hit the views of the board, and who would now see that it was carried into effect.

Dr. ROBINSON seconded the proposition, which was put and carried unanimously.

Mr. ROBINS acknowledged the vote, assuring the directors and shareholders that he fully appreciated the liberality he had always experienced at their hands, which had been, and would continue to be, an additional incentive to him to use his best energies to promote the best interests of the company.

A vote of thanks to the Chairman and directors closed the proceedings.

TECOMA SILVER MINING COMPANY.

The statutory meeting of shareholders was held at the London Tavern, on Monday,—Sir ALEXANDER MALET in the chair.

Mr. J. D. SCOTT (secretary) read the notice convening the meeting.

The CHAIRMAN said the present was the statutory meeting, prescribed by the Act of Parliament of 1867. The Act does not in any particular enjoin that any special business shall be done, but the directors were very glad to meet the shareholders and give them such information as in their power to communicate. The company took possession of the property on March 11, under the authority of a letter from Mr. Gilchrist, their lawyer, an extract of which he would read:—

"I accordingly made a very thorough personal examination of the property and its surroundings, the records and mesne conveyances to the vendors, and the county records of Box Elder County, where the property is situated, as well as all other records of the Courts where liens, judgmenrs, and incumbrances are required by law to be filed and recorded. Found everything clear, perfect, and regular, and that the vendors could make a perfect title to the property according to the covenants of the deed."

Upon the acceptance of the property, they directed their superintendent, Mr. Maxwell, to proceed with all matters as fast as possible. Mr. Maxwell, as the shareholders are aware, is their general superintendent; that gentleman wrote to the directors on April 7, as follows:

Flagstaff Furnaces, April 7: Since last writing you I have been quite busy in making arrangements for the development of the mines. Our buildings are in a forward state, and on Thursday next I shall take out with me 15 more good miners and set them to work. I have estimated the cost for the erection of furnaces at Tecoma, the cost of transmitting bullion, and production of charcoal; I have also estimated the cost of transmitting bullion from Truckee to Liverpool, and the production of charcoal at Truckee, which amounts to from 8 to 9 cents per bushel delivered. The Central Pacific Railroad Company are willing to give us very favourable rates on ore and bullion, in order to ensure our custom to their line should we conclude to meet at Truckee. There are now at Truckee two furnaces, with place provided for a third, and these furnaces I have contracted to purchase and place in thorough repair, and in about three weeks to one month from now they will be turning out bullion. The interests of the company are best served by this action, as both time and expense will be saved. A good road has been opened up to the mine, and 1000 sacks of ore will shortly be hauled down to the railroad depôt by teams now on the spot sent out from Salt Lake City. The railroad company have donated us a piece of land at Tecoma Railway Station, and they are now putting in a loop siding so as to facilitate as much as possible the shipping of ores. I shall be at the mine on Friday next, and will report to you condition and prospects. I have an excellent mining agent in charge of the business, and everything is progressing very satisfactorily, considering that the district is new, and we have had to do everything to start up the enterprise.—MICHAEL M. MAXWELL.

He explained that Truckee is a station on the Central Pacific Railway—the letter is dated April 7, but was not received till May 7; the envelope bears the post-mark of Granite City, April 17, and Chicago, April 27; it is presumed, therefore, there must have been delay on the road. The fact that the railway company were making a station for the receipt of the ore is evident there will be ore to send. Besides Mr. Maxwell's superintendence, Capt. Forbes had gone out to give general assistance to Mr. Maxwell, who was over-charged. Capt. Forbes is a well-known organiser, and very capable of giving complete assistance. The directors sent out a telegram to Mr. Maxwell, asking for the latest advices; his reply is—"Busy shipping ore; buildings completed; 50 men developing mines; furnaces ready to start on Thursday, the 15th." He had nothing further to communicate, but would be glad to answer any questions.

A SHAREHOLDER asked the distance from the mines to the railway?——The CHAIRMAN said the distance is about six miles, and there is a good road the whole way.

A SHAREHOLDER asked the meaning of the term "shipping?"——The CHAIRMAN explained that it is an American term for putting ore into trucks sent from the railway station at Truckee, where the smelting works are situated.

A SHAREHOLDER asked if the directors had any assays made of the ore?——The CHAIRMAN said that some of the ore had been assayed, and the result bore out the statement in the prospectus. Private accounts also confirm all the statements in the prospectus—in fact, rather beyond that, but the directors do not wish to raise any undue expectations. Private accounts had been received by the vendors from some independent persons, which fully confirm all the statements previously made—particularly as to the richness of the ore.

A SHAREHOLDER asked if the board could give any idea when a dividend is likely to be paid?——The CHAIRMAN said no sort of apprehension is entertained by the board that what had been held out in the prospectus will not be literally realised—that is, a dividend will be paid within four months of taking possession of the property, and possession was taken on March 11.

Mr. F. W. MANSELL enquired if any official estimate had been received as to the reserves of ore in the respective mines?——The CHAIRMAN said the directors had received no special report upon that point. The letter he had just read stated that Mr. Maxwell would be at the mines on the following Friday; the result of the visit, which the directors have not yet received will, no doubt, contain the information upon the question of reserves.

A SHAREHOLDER asked if any assay had been made of the 1000 sacks of ore said to be shipped?——The CHAIRMAN said that is the information they were awaiting—there are four mines at work, and the quality of the ore varies very considerably. One tunnel will tap the four lodes.

Col. STANFORD explained that there are four mines containing 8000 ft., the property of the Flagstaff being 2200 ft.——Mr. F. W. MANSELL said his private advices informed him that there are four distinct mines, each containing a different lode, the principal one being in the Shanley Mine, to which in depth the others will form tributaries, as was the case with the celebrated Comstock.

Col. STANFORD said assays of the ore had been made, showing it to be very rich, but he has not said much about it because the assays ran so exceedingly high. He might say, however, the ore will certainly net twice as much as Flagstaff. The reserves at the time the company was started were estimated at 8750,000.

The CHAIRMAN said the value of the tunnel location was pointed out in the prospectus.——A SHAREHOLDER suggested that the Tecoma Company should adopt some more distinct form of accounts than that in the Flagstaff Company.——The CHAIRMAN said that one of the principal objects which Capt. Forbes has in view is to regulate the accounts.

A vote of thanks to the Chairman and directors closed the proceedings.

HORNACHOS SILVER-LEAD MINING COMPANY.

The statutory meeting was held at the offices, Great Winchester-street, on Thursday,—The Hon. Mr. PONSONBY in the chair.

Mr. W. BATTYE (secretary) read the notice convening the meeting.

The CHAIRMAN said the present meeting was purely formal in character, held pursuant to the provisions of the Companies Act, which rendered it obligatory on the part of directors to convene the shareholders together within four months of the registration of a company. Although upon this occasion he had nothing very special to communicate, he might mention that 5732 shares—including those to the vendors—had been allotted, which is very nearly the full amount it was proposed to issue. The reports received from the manager, which would be read, stated that the company possesses one of the best mines he had seen, but that there is some work to be done before dividends were paid. The machinery will be at work in a few weeks, from which time they might begin to look forward for the realisation of satisfactory results.

Mr. BATTYE then read the following report:—

May 5.—Descuidada Mine: This mine has been drained, and an engine-shaft has been sunk to a depth of 112 ft., and a 9-in. lift of pumps fixed and ready to work. The erection of the 20-in. horizontal steam-engine, which is very strongly made, with drawing apparatus, &c., is almost finished, and the boiler will be completed in the present week. I calculate we shall put the engine to work in about three weeks from this date. The quantity of water being small for an engine we shall not be long reaching the bottom of the old workings after the engine goes to work. In the centre of this mine for a length of 50 fathoms the lode has been taken away so far down as the mine has been drained. From the specimens of galena, carbonates, and phosphates of lead that I have broken from the sides left by the ancient workers I believe we shall find a good lode in the bottom of the old workings.—Afortunada Mine: A good shaft has been sunk 15½ fathoms, the first 9 fathoms being through old workings. The lode is looking better in the present bottom than it has since the mine has been working, being 2 ft. wide, composed of galena, copper, and iron pyrites, intermixed with a beautiful gossan. From the 8 fathoms of whole ground sunk through I calculate about 5 tons of silver-lead ore has been taken out; the present value is rather more than 1 ton per fathom. I have never seen a finer looking lode for the depth, and I have no doubt after sinking another 15 fathoms we shall be able to make regular and profitable returns. In the past week I have set the shaft to a good party of miners to sink 10 metres, which will be the depth required for starting a level north and south. It will take about ten weeks for them to complete the contract; no time shall be lost in forcing down this shaft. From present appearances it will be some time before any expensive machinery will be required, and there being a river not far from the mine no steam power will be necessary.

Pureza de Luiza Mine: A shaft has been sunk 21 fathoms on the course of the west lode. In the former part of the sink the lode varied from 1 to 2 ft. in length, composed chiefly of gossan and quartz, in which were found good stones of galena; in the latter part of the sink the lode has changed into blende and sulphur of lime; the size of the lode in the last 3 ft. sunk is about 6 in., and the blende appears to be dying out. In another 12 ft. sinking we shall be able to form a better opinion of what the lode is likely to turn out. The men have been engaged in the past five weeks in driving a cross cut west from the bottom of the shaft, to prove if a part of the lode that split off in that direction, about 14 fms. from surface, is making in depth; it will take another fortnight to complete this trial: we shall then resume the sinking of the shaft. We have employed on the Descuidada Mine 42 men and boys, on the Afortunada Mine 15, and on the Pureza de Luisa Mine 12.

We shall be able to discharge 12 men from the Descuidada Mine as soon as the engine pool is completed; this will take four or five days more. In conclusion, I would remark from what I have seen, especially in the Afortunada Mine, and the chance of discovering a good lode when we get to the bottom of the Descuidada Mine, I feel no hesitation in saying that when fully developed I believe you will be amply repaid for your outlay.—JOHN HANCOCK, jun.

A SHAREHOLDER enquired if a visit had not been paid to the mines by some of the directors?

The CHAIRMAN said that a private visit had been paid to the mines by Mr. Martin, one of the directors, and Mr. Pattison the solicitor.

Mr. MARTIN, at the request of the meeting, stated that he believed the property is one that, when developed, will turn out well, but until the water has been got out of the Descuidada Mine it is impossible to say what it will be; but he thought the property a very good one, and that its prospects were of the most encouraging character. They must not, however, expect to do much for a short time.

The CHAIRMAN said the crushing machinery would shortly be on its way to the mines, and they hoped shortly to be able to make returns. At present the produce is sent on mules' backs a distance of about 10 miles, along which the machinery has to be taken in pieces.——Mr. PARISOT mentioned that the road is only bad for a short distance up to the mine.

The CHAIRMAN said they are hoping soon to have a railway within about 9 miles of the mines. The ore is very rich, and not like English lead ore.

A SHAREHOLDER asked if there was any danger of the ore being stolen by the Carlists?——The CHAIRMAN said he should think that those in the district had hardly yet heard of the revolution, the district being close to the frontiers of Portugal.

The election of Mr. J. Russell Frewer as a director was confirmed.

Mr. FREWER having acknowledged the vote, stated that he took a deep interest in the affairs of the company, and he hoped eventually the enterprise would prove a successful one.

A vote of thanks was passed to the Chairman and directors.

The CHAIRMAN thanked the shareholders for this renewed mark of confidence, and expressed a hope that the next time they met there would be something more pleasant and substantial to communicate.

The meeting then separated.

ALMADA AND TIRITO MINING COMPANY.

The report of the directors, prepared for presentation at the forthcoming meeting, states that the net profit on the half-year's working amounts to 9576*l.*, as compared with 6086*l.* during the previous six months. The diminution in the net returns during the first three months of the current year, as advised by Mr. Clemes, is easily accounted for; the green metals have fallen off in quantity, and the manager is purposely husbanding them, whilst on the other hand the present appliances are insufficient to materially increase the yield of concentrated black ores; a few months will, however, alter this state of things, as with the crusher the monthly quantity can be doubled, and with the schooner vexatious delays avoided. The total amount at credit of revenue is 11,779*l.* 15s. 2d., out of which the directors propose to declare a dividend at the rate of 10 per cent. per annum, free of income tax, for the half-year ending Dec. 31 (which will absorb 6500*l.*), and to carry forward 5279*l.* 15s. 2d. to next account. The report of Mr. Clemes is an elaborate and interesting one, referring to the results, operations, stores supply, prospects, &c. As to the state of the country, peace has been fully restored; there are no interruptions, and the supply of ordinary native labour is ample.

EAST WHEAL BASSET MINING COMPANY.

A general meeting of shareholders was held at the mine, on Tuesday,—Mr. ABBOTT (purser) in the chair. The notice convening the meeting was read, and the statement of accounts, showing a debit balance of 2173*l.*, and a loss on the three months' working of 1947*l.*, was submitted.

The agent's report, after referring to the various points of operation, stated that since the last meeting the stamps had been working a great part of the time on low quality stuff that accumulated last year. They had sold 7 tons 18 cwts. 3 qrs. 9 lbs.—1 ton 12 cwts. 1 qr. 17 lbs. at 84*l.* 15s., and 6 tons 6 cwts. 1 qr. 20 lbs. at 82*l.* 7s. 6d. They had had but a short time to dress since the burning-house was completed, otherwise they would have increased the quantity. Coals and other materials continue at the advanced prices, so that the calculations made at the time the erections were commenced on the then existing prices have to be considerably modified, the labour supply also being limited. Although the ends are not rich on the north lode, there is a great deal of unexplored ground about and above the 80 fm. level, and only a short time will be required to speak more positively on its merits. Such a lode as they had in the 80 would considerably alter the aspect of affairs, and he saw no reason why such might not be anticipated. He thought it advisable to employ all the available means on the tin ground discovered (and there is a great quantity of it), and thereby increase the returns without largely increasing the cost. The water in Copper Hill, eastern part, is now down to the 40. There is only a short cross-cut, driven about 12 fms. long, at this point. The lodes opened on all the principal workings of Copper Hill are as yet under water.

Capt. LEAN said they had 60 men at work now, but many were leaving. Five left last week to go to America, and five were under notice to follow them. The more money they got the more they were inclined to leave, probably because they got sufficient money to emigate. The carpenter and blacksmith had given notice.

Mr. R. TEAGUE suggested that the difficulty of getting men on the mine was attributable to such causes as the dismissal of men for pointing out, in the interest of shareholders, things which were not going right. He believed there was more money wasted in this mine than in any trade or profession in the county. The management in some directions he considered infamous.

Capt. LEAN admitted that he had dismissed men for being too busy; and Capt. PRYOR suggested that if miners were to be allowed, in the interest of individual shareholders, to disobey or dictate to the agent, speculative mining would cease.

It was resolved to dial the portion of the mine in which explorations for tin are going on, and plan them on a larger scale.

Capt. LEAN thought their best chances of success were in the shallow portions of the mine.

Mr. ABBOTT, in reply to a question, said he had received a letter from Messrs. Hocking and Son, engineers, stating that the engine wanted a new condensing cistern, a new piston-rod, and other repairs, amounting to about 160*l.* One of the boilers might be repaired as it stood, but the engineers suggested that it would be cheaper to replace the other by a secondhand one.

Capt. PRYOR thought as the engine had carried them over the winter it could continue until they had settled whether the prospects of the mine would justify any further outlay.

Mr. TEAGUE believed the costs of the stamps swallowed up more than the value of the tin, and thought it would pay them better to sell their tin in the stone to bargain buyers. He preferred to sell little at a profit than much at a great loss.

Mr. GRYLLS thought if they were going to work a mine they should work it completely, as did Wheal Buller, Wheal Uny, and other neighbouring mines, all of which made rich tin, after being rich for copper; and he did not see that East Basset should stand alone in not following this course.

Capt. LEAN, in explanation of the fact that during the last three months only 14 fms. had been laid open for tin, said there were so many cross-cuts, and they were laying open more than they were taking away. There was more ground laid open now than they could take away in two years. He believed it would be impossible to raise 2000 tons of stuff worth 32s. per ton in the three months. So far from considering the tin ground under the water likely to pay costs he did not believe it was worth a rap.

The offer of Capt. Charles Thomas, of Wheal Buller, to supply the stamps with water for 20*l.* a year was accepted. The proposition to hold a special meeting in London was rejected.

Captain PRYOR said that the parties whom he represented were determined that such a meeting should be held, at which the prospects and future working of the mine should be discussed.——Mr. GRYLLS expressed his full confidence in the mine. All their neighbours, like themselves, had prosperous courses of copper, and had now got into good tin; and he could not think that East Basset would remain the only poor mine in the district. Let them remember that Dolcoath was 15 years, and Cook's Kitchen 50 years, in going from copper to tin.

Captain PRYOR also believed in the future of the mine, and was certain that it could be worked better. The manner in which it could be done, according to his view, he would not disclose till the special meeting was held. Those who prompted him to move for this special meeting had determined not to pay another call till it was held.

The votes of those present at the meeting were 54 in favour of the motion for holding the special meeting in London, and 17 for the amendment to hold it on the mine; but Mr. Paull using 108 proxies in favour of the amendment, whilst Capt. Pryor refusing to use those in support of the motion held by him, the amendment was declared carried by 125, against 56. The proceedings then terminated.

WEST FRANCES MINING COMPANY.

A meeting of the adventurers was held at the mine, on Thursday Mr. W. PIKE (the purser), in the chair. There was a large attendance. The accounts showed a debit balance of 591*l.* 19s. The agent's report was considered satisfactory. Capt. Josiah Thomas added that he could raise more tin if he could get more men. They were very short of men just now; they could employ 20 or 30 more very profitably. There had been much emigration in the district, and the more money they gave the men the more facilities it gave them for getting away. There was a sort of mania to get abroad, but the men might not find it so bright in America as they thought, and some of them might return again. On the motion of Mr. BAILEY, seconded by Mr. P. P. SMITH, the accounts were allowed, and the balance was carried over to the next account.

Mr. PIKE then proceeded to refer to the question of the encroachments by South Frances. At the last meeting they had appointed a committee to settle the matter. The committee had written a report on the subject, which consisted principally of the correspondence which took place between the committee and the South Frances committee, which correspondence had already been published, and it concluded with the announcement that the negociations had been unsuccessful, and that Mr. Pease had refused to sanction an exchange of territory. The committee had always been of opinion that this was a matter for arbitration, and the first letter written by them proposed that course, and they thought that before taking measures to enforce an offer should be made again to refer the question to arbitration to some independent men. Mr. Pike added that at the last meeting the shareholders decidedly refused to give up any of their territory, and any single shareholder had power legally to prevent the cession of the smallest bit of their territory. Under those circumstances the committee were of opinion that it only remained for them to deal with the matter in a plain business way by a money payment for the encroachment. There was no obstructiveness on the part of the committee; they simply wanted to be paid for the ores taken away in money, and not in kind. They had offered to refer the matter to arbitration twice. It had been objected that the arbitrators would only take the amounts named on each side and split the difference, but if men were appointed that would go into every detail, and do justice to the matter, that argument would not hold. It would be proposed to leave the matter to arbitration again, and that Mr. Pease and Mr. Cartwright should be the arbitrators. These gentlemen would do thorough justice to both parties. He had every confidence in Mr. Pease, and he was sure Mr. Cartwright would act justly.

Mr. JOHN THOMAS thought it was hardly reasonable for one party to name both arbitrators.

Mr. P. P. SMITH said, as a member of the committee, and a large shareholder in the mine, he deeply regretted the failure of their negociations. At the meeting, held at Truro, the representatives the lords were present, and he thought it important they should first endeavour to clear the ground before they at all discussed the question of what should be paid by South Frances. Mr. Pease, the agent for Mr. Fortescue, thought a very large amount was due for ores—on some 11,000*l.* or 12,000*l.* worth of ores—but he (Mr. Pease) thought that the matter had been very carefully gone into by the principal agents of the two mines, and the result had shown that the amount might be considered to be about 5800*l.* Mr. Pease was perfectly satisfied with the explanation, and Mr. Cartwright stated that whatever the amount was it would be paid. Then as to the cost of the returning charges, that had also been discussed by the agents, and the amount arrived at was 1900*l.*, which would reduce the amount to 3900*l.* After a long friendly discussion they arrived at the conclusion named in the report. There were two alternative propositions—one dealing partly with territory, and the other with money only, and the South Frances committee said they could not accept the proposition made by the committee of West Frances. There was no one in the room, or perhaps in the county, who could tell them more of the disastrous effects of litigation between two mines. He thought he should be borne out by some gentlemen present that he had used every personal effort that he could in order to bring about some sort of arrangement. (Hear, hear.) He felt that they must give and take in this matter. Although ores had been taken from that mine, and although they might feel justified in demanding compensation to the fullest, yet he was bound, and he did so as a large shareholder, to warn them against going into litigation if the matter could be settled in any fair and business like manner. (Hear, hear.) If there ever was a case this was one for settlement in an amicable manner. Mr. Thomas, a member of the South Frances committee, in the presence of others, said that he (Mr. Smith) had acted as if he had been an umpire; but he replied that if he had been an umpire he would have settled it in five minutes. (Laughter.) There were reasons why it was not settled, and he did not find fault with those who put forward those reasons. It was to him a source of personal regret that it had not been settled. He did not think, however, that the time had been utterly lost in the discussion of the question. Since he had come into the room a series of propositions had been put into his hands, and they appeared to him to be perfectly reasonable. They were as follows:—

1.—To leave the amount to be paid West Frances by South Frances to arbitration in the usual way.

2.—To consider the money value of the ground taken to be 5800*l.*, and leave the returning charges to arbitration.

3.—To take 3500*l.* (as before offered) in full discharge of the amount due.

4.—To leave the amount to be paid to the decision of the lord's agents to the respective mines, Messrs. Cartwright and Pease, with power for them to appoint an umpire.

Mr. Smith then went on to say they should remember the litigation between South Frances and West Basset. He had no doubt that a sum of between 20,000*l.* and 25,000*l.* had been spent in that litigation. (Hear, hear.) And what was the state of those mines during that Trojan war? What did West Basset sell for in the beginning of it? He believed some shares sold for 1s. each. And what was the state of South Frances he should like to know, and what were the prospects of each mine immediately after the changes took place upon the occasion of that lawsuit coming to an end? Each had an opportunity of showing that if developed it would be likely to become an extremely valuable and important property to the shareholders. He would ask what could be fairer than to offer to leave the matter to arbitration? Surely there were two or three men in the county who could settle this question satisfactorily. The lords were agreed; Mr. Pease said he would accept 5800*l.* as the amount of ore; and Mr. Cartwright said he would pay upon that. They had to fix the returning charges, and they would then get at the amount. He was quite willing to believe that those who represented South Frances, and those who preceded them, were ignorant of what they were doing when they took the ore away. They should not cast stones at each other. Let them believe it was done ignorantly and innocently. Let them, like men of business, ascertain practically what amount was taken away, and then, as honest people, South Francis would wish to pay for it. If he were appointing ordinary arbitrators he would not mention the second, but these gentlemen (Messrs. Cartwright and Pease) represented the lords of the respective mines, and would have power to elect an umpire if they differed. He thought nothing could be more fair. (Hear, hear.) This proposition was made with the sincerest possible desire to see an amicable agreement come to, and one which would be satisfactory to the mining community generally.

Mr. BAILY seconded the proposition. He is the largest shareholder in the mine, and one of the very oldest, and it had been his desire since the question first arose that it should be amicably arranged. The committee had done all they could, and he must say he felt very strongly as to what had been said as to the West Frances shareholders standing in the way of a settlement. They had done everything they could to get it settled, and they were quite as willing now to settle it as ever. He had great pleasure in seconding the motion.

The motion was put to the meeting and carried, no hands being raised against it. The business then concluded.

EAST POOL MINING COMPANY.

The two-monthly meeting of adventurers was held on Monday, under the presidency of Mr. DENNIS. The accounts showed a total receipt for the two months of 6563*l.* 5s. 8d.; copper ore selling for 1209*l.*, and tin ore for 5121*l.* The labour cost for the two months was 3407*l.* 17s. 8d., and the merchants' bills 1892*l.* 4s. 11d. The balance of profit on the two months' working was 800*l.* 0s. 11d., and this just met the 2s. 6d. dividend, which was declared. The agents' report was read, as follows:—

May 12.—Great Lode: The 180 is driven east from the engine-shaft 21 fms., and is worth for tin 35*l.* per fathom. The 180 is driven 22 fathoms west of the engine-shaft, or 9 fms. west of No. 2 winze, and is worth 22*l.* per fathom. A stope in the back of this level is worth 20*l.* per fathom. The 170 is driven 17 fms. west of the cross-course, and is worth 10*l.* per fathom. There are two stopes in the back of the 170, worth 20*l.* per fathom each stope, and two in the bottom of the same value. The 160 is driven south of Pryce's lode 14 fms.; it is still in killas, but the ground is a little harder for driving. The winze 11 fms. west of the cross-course, in the bottom of this level, is down 8 fms., and is worth 10*l.* per fathom.—Engine Lode: A stope in the bottom of the 160, east of Dennis's cross-cut, is worth 18*l.* per fathom. There are two stopes in the back of the 160, east of Dennis's cross-cut, worth 25*l.* per fathom each stope.—South Lode: The 150 is driven west of the cross-course 17 fms., and is worth for tin 10*l.* per fathom. The 140 is driven 9 fms. west of the cross-course, and is worth for copper 20*l.* per fathom. A rise in the back of this level, on the cross course, is up 1 fm., and producing a little tin. The 130 cross-cut, on the cross-course, is driven 23 fathoms south of the engine lode. The 130 is driven east of the western cross-course 67 fms., and is worth for tin and copper 18*l.* per fathom. A stope east of the cross-course, in the bottom of this level, is worth for copper 25*l.* per fathom. The winze in the bottom of this level, 24 fms. east of the cross-course, is down 6 fms., and is worth for copper 20*l.* per fathom. Since our last account Barncoose Mine has ceased to work, and we may naturally expect a little increase of water from that quarter; but with the dry weather our water has been lessening, and we hope in future to work with a less quantity of coals, the coal bill for the two months now charged being 1200*l.* We have pleasure in being able to state that the underground prospects of the mine were never better.—W. S. GARBY (Manager), JOHN MAYNARD, JOHN HOSKING.

The CHAIRMAN said the adventurers were all aware that during the last two months the mine had had to contend with very considerable difficulties. In a certain newspaper endeavours had been made to show that there was something dishonourable in their management. Two and a half years ago East Pool was paying dividends of 5s. per share every two months. The manager and committee, after due deliberation, then came to the conclusion that by the erection of a new steam-whim on the best and boldest principle the dividends could be continued, and extra mineral enough raised to pay for the outlay. Unfortunately, before that was carried out the approaching stoppage of Great South Tolgus rendered it requisite that provision should be made against the extra quantity of water that would in consequence visit them. So at considerable expense the Tehidy sett was purchased, and a number of dams erected. Then came the unfortunate trespass on South Crofty, which cost something like 2500*l.* This was followed by the winter, in the course of which the old Wheal Agar dam broke, and the East Pool was for some time seriously flooded. It was the duty of Wheal Agar to have avoided this; but, as Wheal Agar refused to do the repairs, they were obliged to do them. Wheal Agar had done them another kindness, by stopping their own engine and throwing back their water on East Pool. The committee, however, were now thoroughly determined to stick to their own mine, to pump their own water, and care nothing for their neighbours; and they had instructed their manager to look out for an 80-in. engine. Their extra expenses arising from all these sources, and from the thirteenth month's pay, had led to an additional expenditure of just 9000*l.* All this had been accompanied by an enormous increase in the prices of coals, iron, and materials generally (their coal bill was 1200*l.*, as against 400*l.* before the rise). But notwithstanding this, and the fact that the best mineral part of the mine had been more than one-third under water, they were only 5251*l.* in debt. At the present time they had three distinct discoveries in the mine; in the north or old part of the mine, the south lode, which they had driven 75 fathoms—a great, strong champion lode, the average width of which was fully 2 fathoms; and the 160 east, where two stopes were working, which had been very mildly put in the report. In fact, he had never seen East Pool looking so well; and the committee had the pleasure of recommending a 2s. 6d. dividend, being convinced at the same time that they would soon be able to pay off the debt. He was satisfied that there was a good time coming. Coals are going down. He had purchased "through and through" at 1*l.* 1s. a ton for Wheal Basset, and they had been offered, delivered, at 1*l.* 1s. 6d. He moved the adoption of the report and accounts.

Mr. R. R. BROAD, in seconding, endorsed every word that had fallen from the Chairman as to the condition of the mine. The committee looked forward not only to paying a regular 2s. 6d. dividend, but also to leaving a surplus which in a few meetings would be enough to clear off the debt. The motion was unanimously adopted.

DOLCOATH MINING COMPANY.

The twelve-weekly meeting of adventurers was held on Monday, Mr. CARTWRIGHT presiding. There was a large attendance. The accounts showed—Received: By 231 tons 11 cwts. 3 qrs. 2 lbs. of black tin, 19,613*l.* 11s. 10d.; less dues, 980*l.* 13s. 7d.—Expended: Labour cost, February, March, and April, 10,531*l.* 4s. 5d.; merchants' bills, 4125*l.* 6s. 3d. Profit 4182*l.* 9s. 2d., making with balance of 141*l.* 9s. 1d. from last account an available balance for dividend of 4323*l.* 18s. 3d. The agent's report stated:—

The 314, east of the engine-shaft, is worth 40*l.* per fathom. We have commenced to sink a winze under the 302, just over this end, where the lode produces a little tin. We expect this winze will improve on being sunk deeper. The winze under the 302, 18 fms. further east, is sunk 2½ fms., and is worth for 9 ft. long 180*l.* per fathom. The 302, east of New East, is worth 20*l.* per fathom. The winze under the 290, 3 fms. before this end, is sunk 3 fms., and is worth for 9 ft. long 40*l.* per fathom. The 302, west of the engine-shaft, is producing a little tin. The old sump shaft is sunk to the 302, and we are now driving east to communicate with the 302, west of the engine-shaft, which we hope to do in about a month. The 290, east of New East, is worth 15*l.* per fathom. The 290, west of old sump, is worth 10*l.* per fathom. The winze under the 278 has been holed to this end, and the ground set to stope. The 278, west of old sump, is worth 10*l.* per fathom. The winze under the 266 is worth for 9 ft. long 18*l.* per fathom. The 248, west of Harriett's, is worth 20*l.* per fathom. The 248, east of Harriett's, is unproductive. Wheal Bryant shaft is suspended for the present, on account of the large quantity of water. The 236, west of Harriett's, is worth 30*l.* per fathom. The winze under the 224 is nearly holed to this level. The part on which we are sinking is not of much value, but a much better part is standing to the north, which when last seen was worth 40*l.* per fathom. The 224, west of Harriett's, is worth 40*l.* per fathom. The 212, west of Harriett's, is worth 15*l.* per fathom. The 238, east of Stray Park, is producing a little tin. The 215, east of Stray Park, is worth 12*l.* per fathom. The winze under the 190, just over this, is worth for 9 ft. long 20*l.* per fathom.

The CHAIRMAN stated that at a meeting of the committee that morning—present, Sir F. M. Williams, the Rev. W. Butlin, and himself—it had been decided to recommend a dividend of 1*l.* per share. As they knew, that account was for twelve weeks instead of eight or nine as formerly, and, of course, there was twelve weeks' cost against twelve weeks' produce. At the beginning of that period they laboured under some little disadvantage in not being clear of the water, and since then they had had a drop of 8*l.* in tin, which he hoped would not go lower. The provision of a new man-engine had become necessary, and Captain Thomas had purchased a very good one, almost new, for a very reasonable price. It would be put up in the course of the summer.——On the motion of Captain MAYNE and Mr. RABLING, the accounts were passed and the dividend declared.

Captain JOSIAH THOMAS, in answer to Mr. Trebilcock, explained that the present man engine extended to the 212; the new one would be put into the 248. The 248 had not yet reached the spot, but the 236 had; and whenever they could hole to the 248 the engine would be carried down. The new engine would work five strokes a minute, whereas the present one only did three; so that not only would the engine be carried 36 fathoms deeper, but a considerable saving would be made in the men's time. Speaking of the mine generally, Captain J. Thomas said they had got on quite as well as they had expected to do during the 12 weeks, considering the circumstances. Some of them had been doubtful about its being possible to get the water out in time to make any profit during the period, but they succeeded in getting it out much quicker. That showed that the engine and pitwork were in first rate condition, and that the pitmen, sumpmen, and enginemen, must have attended to their duties. As soon as the water was got out these men had a dinner given them in recognition of their services. The present were trying circumstances for working a mine. What with the high price of coals and materials, and the lower price of tin, there were only a few tin mines that were making any profit. Tin was 11*l.* per ton lower than it was at the same time in the previous year; and coals were very much higher. In this respect, however, they must hope for better times. A good many miners were going abroad; but he was quite certain that if the men would only work as long hours in England as they had to do in America they would do quite as well, without having to leave their families. He could mention many cases of men who had been getting regularly during the past year their 6*l.* per month on tutwork. He was sure that mine agents generally would only be too happy to encourage men to earn as much as they could. The mine was looking very well, and if they only had former prices for materials and tin it would do as well as ever it had.——Mr. RABLING enquired what was doing in Stray Park?

Captain THOMAS replied that they were driving east into the western part of Dolcoath, and working at some points with tributers. Stray Park was about paying its own cost, and they derived great advantage from being able to drive levels from it into the western part of their mine.

On the motion of the Rev. Mr. BUTLIN and Mr. T. T. WHEAR, thanks were voted to the Chairman.—*Western Morning News.*

MINERA.—At the meeting, on May 9, a dividend of 4500*l.* (10s. per share) was declared. Many tribute bargains in the mine remain unworked at the present moment, for want of hands to get the ore.

COOK'S KITCHEN.—At the four-monthly meeting on Thursday, the loss was 677*l.*, and the credit balance last account being 112*l.*, the debit balance was 565*l.*, which was carried to next account. The purser (Mr. W. Pike) attributed their present position to the accident of the breaking in of the adit causing inundation of all the productive ground for two months. Capt. Josiah Thomas gave a satisfactory report of the mine.

POLDICE.—At the meeting on Tuesday (Sir F. M. Williams, Bart., M.P., in the chair), the accounts showed a debit balance of 473*l.* It was resolved that the driving of the 77 fm. level east of Sir Frederick's shaft be continued for one month, and that the special meeting be adjourned in consequence to the end of June. More than 1700 of the 2000 shares are held by the Chairman, so that it rests entirely with him as to how long the working shall continue in order to prove the lode, which, however, it is believed will ultimately turn out rich enough to well repay the outlay. The cordial thanks of the meeting were voted to the Chairman for the great interest he has taken in the mine, and the prosperity of the neighbourhood.

WEST WHEAL SETON.—At the meeting, on Tuesday (Mr. B. Matthews, purser, in the chair), the accounts showed a debit balance of 310*l.* The adverse balance included the loss on the thirteenth month of the year. Capt. Bath believed more tin would be returned in the next three months than in the last three, and that copper would not fall off. A call of 7*l.* 15s. per share was made. Mr. Hidderley said that not desiring that West Seton should sink out of sight yet he should pay his portion of the debt most cheerfully, for he believed that in West Wheal Seton they had a great mine for the future. They fell into a little mistake the last two occasions, when they declared dividends instead, as they ought to have done, of paying off their debts.

PERRAN WHEAL VIRGIN.—The usual four-monthly meeting was held at the mine on May 9. Mr. J. R. Paull in the chair. The secretary, Mr. F. R. Wilson, read the financial statement, which showed a debit balance of 456*l.* The agents reported that at the 50 fm. level a cross-cut had been driven west from Sir Frederick's shaft, and cut the lode, which is 3½ feet wide, and composed of quartz, mundic, and flookan, with occasionally good stones of lead. It is a strong, well-defined lode, from which a large stream of water is issuing; also driven south 7 fms., where the lode is 2 feet wide, of a very promising character. The 40 fm. level is driven north 18 fathoms, lode 2½ feet wide, and has occasionally yielded 10 cwts. of lead per fathom. There are about 8 fathoms more to drive to reach the shoot of ore gone down in the bottom of the 26 fm. level, which will take about six weeks more to accomplish. South, this level has been driven about 8 fathoms; in the last 6 feet driven the lode has considerably improved, and is now yielding 1 ton of lead ore per fathom, with every evidence of a continuance. On Thursday 10 tons of ore were sampled, worth 170*l.* The agents recommend the sinking of Sir Frederick's engine shaft with all speed. Capt. George Tremayne, the agent, stated that the principal object for which the mine was started would soon be accomplished, and he should recommend a vigorous prosecution, having great confidence in the undertaking. The relinquishment of 50 shares was accepted; but one of the largest shareholders, who was present, and who previously intended to relinquish his shares, expressed himself so thoroughly satisfied with the report of the agents, and with the improved prospects of the mine, that he determined to continue in the company, and hoped the mine would be vigorously and energetically worked to reach some of the important objects ahead of their levels.—A call of 7s. 6d. per share was made. The arrears of calls amounted to 250*l.* only, and the whole of this is considered good

[For remainder of Meetings see to-day's Journal.]

PROVIDENCE MINES.— Messrs. S. Higgs and Son, in sending the agents' report to the shareholders, say:—"The produce of the mine for many years previous to last November exceeded 20 tons a month, it then unexpectedly fell off for four months to an average of 14 tons a month, which, with the high price of labour, coals, and materials, accounts for the heavy loss; in March, however, the quantity raised was 20 tons, and we hope, and have reason to think, that we shall soon come up to our former position again. Our standard lode has been sunk upon 200 fms. from surface, and has been poor and unproductive; but the ores are found in shoots and deposits from off the lode. A few months since Mr. Warington Smyth went underground to inspect it, and took such an interest in the workings that he remained several hours, and expressed himself pleased and gratified that he had had an opportunity of examining it."

SUCCESS, BUSHY CLIFF, AND NANCY CONSOLS.—These mines, which have for ages lain dorment, or which in fact have not been worked since the time of the Romans—at least there cannot be found any record—have now been taken up by a spirited local company, who appear to be attacking all points of interest in the property with determination and vigour, and where the great richness of the Derbyshire mines is proverbial. It cannot be wondered at that the present proprietory are using such exertions. By referring to the manager's report it will be seen that the appearances and prospects are of the most encouraging nature, and there cannot be a doubt from the report, as well as from other sources, that these mines will at no distant date be found very rich and prove highly profitable, and become one of the great prizes of 1873.—[There are still some shares to be had at par, early application for which should be made to the secretary, 61, Osmaston-street, Derby.]

CORNISH MINE SHARE MARKET.—Unexpected as was the drop in the tin standards, which was announced last week, the reduction of 2s. per cwt., which took place on Monday, excited still more surprise, and caused the weakness in tin shares to increase. The copper market also is not so firm as it has been. During the past week but very few shares have changed hands, and the market has been very dull, and although no important fluctuations have taken place, yet almost every share has a downward tendency. It is more than probable that a reaction will take place, and certainly the sooner the better. Parties, therefore, who have got the nerve to go in now that shares are low seem to stand a good chance of making profits. The following are the closing prices:—Carn Brea nominally 130 to 135. A few Cook's Kitchen shares have changed hands at about 20, 21; the meeting is to be held to-day (Thursday). Dolcoath, 62 to 63, but scarcely anything doing; at the meeting on Monday a dividend of 1*l.* per share was declared—rather below what some people expected. East Basset, 10 to 12; a call of 4*l.* per share was made at the meeting. East Pool, 10 to 11; a dividend of 2s. 6d. per share was declared at the meeting on Monday, in the face of such a large debit balance as was shown, which course can hardly be justified. East Lovell, 17 to 18, dull. Great Wheal Vor nominally 6¼ to 6¾. New Rosewarne, 3¼ to 3½, but very little doing. New Cook's Kitchen, 1⅝ to 2; the meeting is to be held to-day (Thursday). New Lovell quiet at 15s. to 17s. 6d. North Roskear, 18 to 20, but very few transactions. Providence, 10 to 11; Rosewall Hill, 20s. to 22s. 6d. A little business has been done in South Carn Brea shares at 4½ to 4⅝, at which price they remain firm; the improvement referred to last week still holds good. South Condurrow, 6¾ to 7⅛. South Crofty, 53 to 55, but little doing; the meeting is to be held to-morrow (Friday). South Frances, 12 to 13, very quiet. St. Ives Consols, 15 to 15½; scarcely any transactions reported. Tincroft, 54 to 55; no business done. Unity Wood, 20s. to 22s. 6d. West Basset, 10 to 10½, dull. West Chiverton share are steady at 11½ to 12. West Frances, 12 to 13; the meeting is to be held to-day (Thursday), and it is hoped that some course will be suggested to arrive at a speedy settlement of the boundary dispute. West Setons, since the meeting on Tuesday last, when a call of 7*l.* 15s. per share was made to wipe off the debit balance, have advanced to 40, 45; it should be considered that this call was made to meet the deficiency of the past two quarters, as there should have been a call made at the previous meeting; it is to be hoped that this formerly successful mine will soon re-enter the Dividend List. West Tolgus, 32 to 34. Wheal Jane, 2 to 2½. Wheal Kitty (St. Agnes), 14¼ to 15¼, rather quiet. Wheal Margaret, 4½ to 5½. Wheal Basset, 62½ to 65. Wheal Seton, 51 to 53. Wheal Uny, 4½ to 5.—*West Briton.*

The Prize Essay—Practical Mining.

No. VI.

AUXILIARY MACHINES AND TOOLS.

CAPSTANS.

These are used for the purpose of raising and lowering heavy weights in the shaft, such as the portions of pitwork, &c. They are constructed to work either by hand or steam-power, and of all sizes suitable to the work. *Hand Capstans* are usually made on the mine, and their construction is so well known as to need no particular description. In cases where the pitwork is very heavy two capstans are often used to the same shaft; one used only in lifting the heavy work, and the smaller one for lighter purposes. The axles of these capstans are generally of oak, but sometimes are made of cast-iron. The price of cast-iron axles and blocks are charged from 12s. to 14s. per cwt.

Steam Capstans are now being largely used instead of those worked by manual labour; the work is done more expeditiously by them, and at less cost; they can be used immediately when required in cases of breakage without delay, which is not always the case when men have to be procured in any other than working time. The steam-capstan is simply a winch with a large barrel; it is either attached to the winding or other engines, or worked by an engine constructed purposely for driving it on the same frame. They are calculated to lift from 10 to 50 tons, and seem to be well adapted to the use of wire-rope, since the drum can be made of any large size suitable to the rope, which in hand capstans would be attended with a great loss of power.

Estimates for steam capstans can be obtained on application to any of the founders already mentioned.

CRANES.

Cranes are largely used in quarries for lifting and moving heavy blocks of stone. In mines small ones are used occasionally, for raising and more easily managing heavy work in the smith and fitting shops. For details and prices of the different kinds of cranes we refer to—Messrs. C. D. Young and Co., Perth; Gwynne and Co., Essex-street Works, Strand, London; Tangye Brothers, Cornwall Works, Birmingham; Williams' Perran Foundry Co., Cornwall; Hayle Foundry Co., Cornwall; Sandycroft Foundry Co., Chester.

WINCHES.

Crabs are used in mines for drawing or raising heavy weights, in the erection and repairing of machinery. They are either single or double purchase—the former are constructed to lift from 1 to 6 tons; the latter from 12 to 16 tons if required. In use they are commonly attached to pulley-blocks for increasing power. We give the following as approximate prices:—Single-purchase crab to lift 5 tons, 2*l.* 10s.; double-purchase do., 8*l.*; if fitted with lowering gear, extra 1*l.*; single or double purchase to lift up to 12 tons, 11*l.*; lowering gear to do, extra 2*l.* Makers—Messrs. C. D. Young and Co., Perth; Williams' Perran Foundry Co., Perranarworthal; Hayle Foundry Co.; Tangye Brothers, Birmingham; Gwynne and Co., London; Sandycroft Foundry Co., Chester.

LIFTING JACKS.

These are used for an endless variety of purposes in mines, and in great variety of form and size. Of late years hydraulic jacks have been largely introduced in public works; they are made to lift either from the foot or top, and are safe in action and not liable to get out of order; one man can lift with the larger sizes 60 tons.

We give the following selection with approximate prices:—

Bottle-Jacks, with cast-iron frame.—To lift 6 tons, 1*l.* 10s.; to lift 10 tons, 2*l.* 10s.

Bottle or Tripod-Jack, with wrought-iron frame.—To lift 6 tons, 3*l.*; to lift 10 tons, 4*l.* 10s.; to lift 18 tons, 7*l.* 15s.

Bottle or Tripod-Jack, with wrought-iron frames and traversing gear.—To lift 6 tons, 6*l.* 10s.; to lift 20 tons, 12*l.* 5s.

These are useful for removing loads on one side when raised.

Rack and Pinion-Jack, double-purchase.—To lift 6 tons, 8*l.* 10s.; to lift 20 tons, 17*l.* 10s.

Hydraulic Lifting-Jacks.—To lift 6 tons (weight of jack 68 lbs.), 7*l.* 12s.; to lift 20 tons (weight of jack, 132 lbs.) 16*l.* 5s.; to lift 60 tons (weight of jack 360 lbs.), 27*l.* 5s. Traversing gear to these extra; for jacks lifting from 4 to 12 tons, 50s.; ditto, 12 to 20 tons, 80s.

Makers, Messrs. Tangye Brothers, Birmingham; Messrs. S. and E. Ransom and Co., Essex-street, Strand, London; Messrs. S. Owens and Co., Whitefriars-street, Fleet-street, London; Messrs. Bailey and Co., Albion Works, Salford, Manchester; and the Cornish founders.

PULLEY BLOCKS.

These are among the indispensable requisites for raising or drawing heavy weights; they are manufactured in a variety of sizes, and generally of wrought-iron; in some of the smaller sizes the sheaves are sometimes made of brass.

We quote a few prices from the copious lists of Messrs. Tangye Brothers, Birmingham, exclusive of lifting chain or ropes:—

Diameter of sheave and width of groove	6 in. × 1 in.	9 in. × 1¼ in.	11 in. × 2¼ in.
Price of 1-sheave pulley	11s. 6d.	30s.	72s.
Price of 2-sheave pulley	17s.	50s.	124s.
Price of 3-sheave pulley	21s. 6d.	70s.	157s.
Price of 4-sheave pulley	28s. 6d.	92s. 6d.	190s.
If brass sheaves, extra	6s. 3d.	—	—
Weight lifted per sheave	12 cwts.	35 cwts.	60 cwts.

Williams' Perran Foundry Company; Hayle Foundry Company.

WESTON'S PATENT DIFFERENTIAL PULLEY.

These pulleys, though slow in action, are more powerful than the ordinary pulley-blocks, and possess the quality of not running down while the load is suspended in them. They are admirably adapted in fixing machinery, for nice adjustment, and their use in many cases would dispense with the attendance of one or more labourers, which would be necessary with the crab and common pulley-blocks. The chain in use with these pulleys is made expressly to fit the different size blocks, and can be had of any length suitable to the required lift, the length required being four times that of the lift.

We give a few sizes and prices:—To lift 10 cwt., 30s. (chain 6d. per ft. extra); 1 ton, 40s. (chain 9d. per ft. extra); 2 ton 65s. (chain 10d. per ft. extra). The varieties of pulley-blocks are exceedingly numerous. Makers, Messrs. Tangye Brothers, Birmingham.

LATHES.

These are quite essential in the execution of repairs to machinery. In all large mines where there is much machinery in operation one or more engineers are employed for keeping it in working order. It is more convenient and economical to do the lighter repairs and alterations on the mine than to send to the foundry. The lathes requisite for mining purposes are such as would be generally useful for the ordinary work of the foundry fitting shop, and they should be provided with change wheels and self-acting arrangements, to secure universality and accuracy of operation. Lathes are made of all sizes, and are widely varied in construction and detail. The prices we give merely show approximately the rates at which they can be obtained. We would refer to the catalogues of makers for further details.

Engineers' foot and hand lathe, with gear for steam-power if required. Height of centres, 6 in.; length of bed, 6 ft.; single speed, 20*l.*; double speed, 25*l.*; slide rest, extra 6*l.* 15s.; extra length of bed-plates per foot, 1*l.* 2s.

Self-acting slide, surfacing, and screw-cutting lathe, with or without bridge-gap; height of centres, 10½ in.; bed, 14 ft.; length between centres, 9 ft. 8 in.; without screw-cutting, 100*l.*; with screw-cutting, 117*l.*; bridge-gap for turning faces up to 3 ft. 3 in. by 11 in., extra 5*l.*; extra length of bed-plate per ft., 3*l.*

Makers, Sir Joseph Whitworth and Co., Manchester; Messrs. Wm. Collier and Co., Greengate, Salford, Manchester; Fairbairn Engineering Company, Manchester; Kendall and Gent, Victoria Works, Manchester; Tangye Brothers, Birmingham.

SCREWING TOOLS AND MACHINES.

From the enormous quantity of bolts and nuts used in mining, it becomes a matter of importance to be able to make them with great speed and economy. They are either screwed by hand or machine, the latter being by far the cheapest. Prices at which dies and taps can be procured:—Set to screw, ½ in., ⅝ in., ¾ in., ⅞ in., 1 in., bolts and nuts, 3*l.* 17s. (tap wrench extra, 18s. 6d.); ditto screw, 1 in., 1⅛ in., 1¼ in., 1⅜ in., 1½ in., 6*l.* 12s. (tap wrench, extra 37s.); ditto screw, 1⅝ in., 1⅝ in., 1¾ in., 1⅞ in., 2 in., 11*l.* 10s. (tap wrench, extra 58s.). The above are all cut to Whitworth's standard, thread and gauge. For makers, see under head of Lathes.

Brown's Patent Screwing Machine.—This machine is said to possess many advantages over the ordinary screwing machines, and the dies can easily be made by any ordinary workman. These machines are made of three sizes: the medium size will screw 16 bolts 1½ inch diameter per hour, 6 in. up. We give prices of the largest which screws from ⅝ in. to 2 in. bolts, the intermediate sizes varying every ⅛th of an inch. For screwing only 72*l.*; screwing and tapping, 82*l.* These are supplied by Messrs. Kendall and Gent, Victoria Works, Manchester; Tangye Brothers, Birmingham. These makers are ready to quote prices for other screwing machines.

PUNCHING AND SHEARING MACHINES.

It becomes necessary in making kibbles and wagons, and in the repairs to boilers to have appliances for shearing and punching plates of iron. A variety of machines are in use for these purposes; some performing each operation singly, others combining both in the same machine. The following are specimens of a few of the varieties, with prices:—

Punching and Shearing Machines for power or hand.—To punch or shear ⅝ in. plate, holes ⅝ in. diameter, 42*l.*; ditto, ¾ in. plate, holes ¾ in. diameter, 68*l.* These are fitted with 1 pair shear blades and 1 punch and die.

Screw Punching Bears.—To punch ¾ in. holes through ⅝ in. plate, 4*l.*

Duplex Lever Punches.—To punch ¾ in. holes through ⅝ in. plate, 12*l.* 10s. These are not liable to break or get out of order. Makers Sir Joseph Whitworth and Co., Manchester; Messrs. Fairbairn Engineering Co., Manchester; Wm. Collier and Co., Greengate, Salford, Manchester; Kendall and Gent, Victoria Works, Manchester; J. and J. Kershaw, Store-street, Manchester; Tangye Brothers, Birmingham.

Hydraulic Punching Bears.—Tangye's patent. To punch ¾ in. holes in ½ in. iron, 10*l.* These machines are recommended for speed and ease in operation, one man being able to punch three holes of the above sizes per minute. Makers of the above, Messrs. Tangye Brothers, Birmingham.

Small Pillar Drills are found useful, as in matching odd pump lifts, where they are required to be newly bored, and for a variety of other uses.

SAWS AND SAWING MACHINERY.

In the use of timber saws of various kinds are essential. We may enumerate those used by manual labour as pit saws for reducing heavy timbers into smaller scantlings. Cross-cut saws for cutting balks to any required length; and hand saws, used more expressly for cutting and fitting together the smaller timbers. The plates of pit saws are supplied at prices varying with size from 20s. upwards; ditto, cross-cut saws, from 12s. upwards; ditto, handsaws, 4s. 6d. each; these are obtainable of all ironmongers. Machinery has been substituted for hand labour in the sawing of timber with very great advantage, as is evident by its adoption in all large works where quantities of timber are cut up. In most mines the consumption of timber is heavy, and we think machine sawing could be introduced with very great advantage. In several mines vertical saw frames have been erected, and in some cases their use has been discontinued, and when it is remembered that the heaviest mine can only keep a saw frame of this kind occasionally at work, it will be seen that they are better adapted to the requirements of the timber merchant than for the mine; but we see no reason why circular saw benches, capable of being driven by water or steam power (a portable engine would do very well) might not be introduced. They might be used for breaking down Norway balks into half timber or quartering, or for the cutting of common plank.

Circular Saws can be had of all sizes upwards from 6 ft. in diameter, and benches are fitted with requisites for cutting the heaviest logs. We give the prices of two medium size self-acting saw benches, in which the rates of speed may be varied from 15 ft. to 60 ft. per minute:—Bench taking saw up to 36 in. in diameter, requiring 6-horse power to drive it, 60*l.*; ditto, with saws to 48 in. in diameter, 8-horse power, 70*l.* Prices may be obtained of all classes of saw benches from Messrs. Samuel Worsam and Co., Oakley Works, King's-road, Chelsea; Charles Powis and Co., Cyclops Works, Millwall Pier, London; Powis James, Western, and Co., Victoria Works, Vine-street, York-road, London; Tangye Brothers, Birmingham.

ADZES, AXES, AUGERS, SPANNERS.

In the construction of mining plant these tools are in constant use; the three former tools are used as well in the preparation of timber for underground purposes.

Adzes are supplied by ironmongers of varying sizes at 9d. per lb., and *Axes* at about 8d. per lb.

Augers are charged simply according to size, and whether shell augers or screw ditto.

Spanners of all sizes are invariably made on the mines; the larger sizes are required of great strength, being subject to heavy strains. A variety of shifting spanners are in use, some of which are adapted for comparatively light work in mines. A good example of this class of spanner is that of Clyburn's.

Messrs. Tangye Brothers' prices for Clyburn's spanners are as follows:—18 in. spanner to suit 1¾ nuts, 14s.; 30 in. spanner to suit 3 in. nuts, 30s.

SCALES AND WEIGHING MACHINES.

Scales of varying sizes are in use in mines; one of large size is required for weighing copper ores, &c., on the dressing-floors, and a small one for weighing copper samples, &c. In determining the value of tin samples a delicate scale is necessary, one weighing with accuracy to half a grain.

Taking into consideration the great amount of material of various kinds supplied to mines, a great portion of which is sold by weight, it is imperative that a check should be kept against those by whom the goods are supplied; hence the necessity of a weighbridge at the entrance of the mine for the purpose.

Messrs. H. Pooley and Son, Albion Foundry, Liverpool, or their agent, Mr. Bailey, Roskear Villas, Camborne, are ready to give prices on application for any kind of cart or waggon, weighbridge, and weighing machinery of all kinds.

MINERS' DIALS.

Dials or theodolites are required to determine with accuracy the direction and dip of mineral veins and their relative positions to each other, the inclination of shafts, the direction of levels, and to show the bearing of the various points of operation to each other.

We select the following prices from Mr. Jeffery's list, Camborne, Cornwall:—Dials from 16*l.* 16s. to 20*l.*; pocket dials, 5*l.*; candle readers, 5*l.*

The following are also makers—Mr. E. T. Newton. St. Day, Cornwall; Mr. W. F. Stanley, Great Turnstile, Holborn, London.

ENGINE COUNTERS.

Engine counters are used for counting the strokes made by the engine in a given length of time, the weight of load borne by the engine being known; the amount of duty, or the relative value of the work performed to the coals consumed is easily determinable. The price of engine counter used on Cornish engines is 4*l.* 4s.; this is best adapted for slow working engines, and is supplied by Mr. Jeffery, of Camborne; or of Mr. E. T. Newton, St. Day.

The *Counter of Schaffer and Budenberg* is best adapted to engines working at high speed. They are supplied to count to 10,000,000 at 3*l.* 15s. Makers, Messrs. Schaffer and Budenberg, 23, Lower King-street, Manchester.

STEAM GAUGES.

For determining with accuracy, the force being exerted by steam in boilers, steam gauges are used as adjuncts to the loaded valves, it not being considered safe to rely entirely on them, from their liability to get fast.

Of the variety of these in use we mention prices of a few—*Bourdon's Steam-Pressure Gauge* to indicate 200 lbs. per square inch, including cocks and unions, 6 in. dials, 42s. each; 7½ in. ditto, 46s. each. *Vacuum Guages* at the same prices.

Schaffer's Patent Steam Pressure Gauges indicating to 300 lbs. per square inch, 6 in. dial, 42s. 6d. *Vacuum Gauges*, same price. *Hydraulic Gauges* to 1500 lbs. per square inch if required, 6 in. dial, 55s. If with pointer to show how high pressure has been, 10s. extra. Makers—Messrs. Schäffer and Budenberg, 23, Lower King-street, Manchester, are extensive makers of steam, vacuum, and hydraulic gauges. Messrs. Bailey and Co., Albion Works, Salford, Manchester, and Messrs. Llewellins and James, Bristol, also supply the different varieties of gauges, &c.

FOREIGN MINING AND METALLURGY.

In the French coal trade matters remain in much the same state. Buyers and sellers maintain a defensive attitude; the former are looking for a fall, the latter do not wish to reduce their rates. Comparatively little business has, under these circumstances, been done, but the transactions concluded have been effected at former rates, although household qualities are naturally neglected. Complaints as to irregularities and difficulties of haulage have become much more numerous, but they remain without result. In the basins of the Nord and the Pas-de-Calais the pretensions of coalowners are being moderated from day to day, but quotations are still maintained pretty well. The approaching investigation into the French coal supply is exciting more and more attention almost every day; the general councils of departments are continually adopting resolutions upon the subject. A new *brochure* has just appeared under the title of "The Coal Basin of the Pas-de-Calais in 1872;" it is from the pen of the Comte de Belleval, Sub-Prefect of the arrondisement of Bethune. The work contains very instructive statistical tables on the production of each of the mines of the Pas-de-Calais. The author also enumerates the causes of the dearness of coal, but, rather unfortunately, he has no remedy to point out. It appears that in the first quarter of this year the imports of coal into France from England declined 100,000 tons, as compared with the corresponding period of 1872. The imports of Belgian coal also fell off to the extent of 100,000 tons. The imports of coke into France in the first quarter of this year presented an increase of 50,000 tons; on the other hand, the exports of coke from France presented an augmentation of about 160,000 tons, or 90 per cent. The trade of France in coal with Italy and Switzerland is increasing from day to day.

The Paris copper market has presented no great change. Chilian in bars has made 96*l.*; ditto in ingots, 98*l.*; tough English, 98*l.*; and Corocoro minerals, 94*l.* per ton. Copper has experienced a regular sale upon the German markets, at the same time, prices have experienced a little feebleness. Business in tin has been transacted with great difficulty at Rotterdam, and the state of affairs has been aggravated by the advance in the rate of discount. The difficulties of the Rotterdam market have, however, been rather occasioned by general circumstances than by the special position of the article. Banca is quoted at 82½ fl., and Billiton at 81½ fl. to 82 fl. The Paris tin market has been declining. The last quotations which have come to hand are:—Banca, delivered at Havre or Paris, 151*l.*; Straits, 154*l.*; and English tin, delivered at Havre or Rouen, 152*l* per ton. The German tin markets have experienced a heavy fall. There have been few variations in lead at Paris, and only small transactions. French lead, delivered at Paris, has brought 24*l.* 8s.; Spanish lead, delivered at Havre, 24*l.* 12s.; English ditto, 23*l.* 16s.; and Belgian and German, 24*l.* per ton. In Germany lead quotations seem to be acquiring increased firmness. There has been no change in zinc at Paris, the quotations of the last few days have not varied. Zinc has been very quiet upon the German markets; transactions have been only concluded to meet the requirements of local consumption.

The Belgian iron trade continues to present a dull tone, but the coal market has not been involved in the general depression to any great extent. Notwithstanding very heavy imports from the Ruhr, notwithstanding a considerable diminution in the number of orders received by the iron trade, and notwithstanding the gloomy condition of the glassworks and sugarworks, prices have been maintained nearly at their former level. There is, however, a general impression that the upward movement in the Belgian coal trade is at an end for the present, and that a fall has become, if not immediately necessary, at any rate probable. Working miners are leaving in considerable numbers, and the production is reduced in consequence; notwithstanding this, stocks are being re-formed at many points, and if they are not large they are, at any rate, of some importance. Upon the whole, a fall seems likely to be witnessed in Belgian coal when the production has regained its ordinary activity, with the return of the coal miners to their employment. Coke is becoming every day less scarce and dear in Belgium. Freights from Charleroi to Paris are maintained at 8s. 10d. per ton; for the interior of Belgium boats are in little demand, and there is a slight downward tendency. Permission has been given to works connected with the Belgian State Railways to carry on their traffic with their own trucks, the current maintenance of which will be undertaken by the State at 2*l.* per truck per annum. The Bonne Espérance Collieries Company, at Lambusart, commenced the payment, on Thursday, of a dividend for 1872.

After displaying an excess of confidence the Belgian iron trade now exhibits an excess of panic. The want of orders, notwithstanding the concessions which have been made, the liquidation of old contracts without any renewals taking place, and the extinction of a large number of puddling-furnaces, had already occasioned a certain uneasiness, and a new tariff, which places iron at 11*l.* per ton, has completed the rout of the trade. Meanwhile consumers maintain an attitude of considerable reserve, hoping as they do to see the downward movement become still more decided. The workmen of M. Delbecque, or at any rate some of them, have gone on strike, because, in presence of the existing state of affairs, it had been deemed advisable to discharge some of their comrades. The moment selected for this strike appears ill-chosen, as some establishments would willingly reduce a production which does not give them great profits. Luxembourg pig is declining in price, and there has been no great amount of business passing in Belgian. Plates have been heavy, and prices have been declining rapidly from the level at which they have long stood. There is a tendency, in fact, to exaggerate the present depression, since the state of affairs had long been too good. The Belgian construction workshops, which hitherto have had abundance of work, begin to experience the effects of the dulness of the times, and their proprietors are anticipating an unfavourable season. The foreign demand for Belgian engines and machinery has very greatly fallen off, as the heavy import duties imposed by the Governments of Germany and France render it difficult, if not impossible, for Belgian mechanical firms to obtain a footing in those countries. It is not without apprehensions that Belgian firms now find themselves reduced to the local demand forthcoming from Belgium itself. A statement issued by the Superintendent of Ways and Works on the Great Central Belgian Railway shows that the average price of steel rails purchased for the system in 1872 was 11*l.* 18s. per ton, and that of the new iron rails 6*l.* 15s. per ton. These comparatively low averages were attributable to the fact that the company had concluded contracts before the late remarkable advance in iron commenced. It is stated that the rails furnished last year to the Great Central Belgian Railway were, nevertheless, better than those supplied to the State lines. The superintendent of the Great Central Belgian states that he continues well satisfied with the trials of iron girders made in 1867 and 1868. The considerable advance which has occurred in iron has, however, completely modified the conditions of the problem involved in the substitution of iron girders for wooden ones.

There has been comparatively little passing in the French iron trade of late. Following the example of Belgian industrials some French ironmasters have preferred to restrict and reduce their production rather than to make concessions in prices which appeared dangerous to them. In the Haute-Marne prices have experienced a fall; that, at least, is the impression which we form from all the advices which reach us. Prices are, however, to so great an extent nominal, and so variable, that it is rather difficult to indicate the fall. Some contracts for coke-made iron have been concluded at 12*l.* 8s., and even 12*l.* per ton. In the Champagne group iron stands

at 12*l.* per ton; in the Nord it has declined to 11*l.* 12s. per ton. Pig, in its turn, follows the downward movement observable in iron. If the reaction has not yet made itself felt in the Haute-Marne it has become more sensible in the Meurthe-et-Moselle group, where refining has declined to 5*l.* 18s. per ton. At Paris the market appears to have regained a little animation, nevertheless most works of construction are suspended. Special iron, No. 1, is quoted at from 13*l.* 4s. to 13*l.* 12s. per ton; pig has been more neglected. M. Martel, director of the Saint-Colombe works, is stated to have succeeded in producing iron of greatly improved quality from Meurthe pig. The extension of the works of MM. Dupont and Dreyfus shows considerable progress; on the other hand, the works of the Champigneuelles and Liverdun Forges do not make much advance. Several French engineers attended the late meeting of the Iron and Steel Institute in England. Among them may be mentioned representatives of the Terrenoire Works and the Pont-Evêque Forges, as well as M. de Wendel, M. Petin, of the late firm of Petin, Gaudet, and Co., and many Belgian industrials also attended. Their principal object seems to have been to collect information with respect to the Danks puddling furnace. The aggregate quantity of minerals imported into France in the first three months of this year was 142,000 tons, showing an increase of 36,000 tons as compared with the corresponding period of 1872. The imports of minerals from Belgium have declined this year, but those from Spain and Algeria have more than doubled. The exports of iron from France in the first quarter of this year present an augmentation of 3300 tons as compared with the corresponding three months of 1872. The exports of minerals, however, declined 13,000 tons in the first quarter of this year, and those of rails fell off 8000 tons. The exports of steel in bars from France in the first three months of this year also presented a diminution of 2500 tons. The exports of the first quarter of 1872 were, perhaps, exceptionally favourable; nevertheless the falling off observable this year must be regarded as a sign of the times.

FOREIGN MINES.

DON PEDRO NORTH DEL REY.—Telegram from Lisbon: Produce for March, 5301 ozts.; weighed to April 18, 1317 ozts.

SWANSEA SMELTING AND MINING (Colorado).—Richard Pearce, April 14: Enclosed please find particulars of fourth shipment, which has been consigned to Messrs. Richardson and Co. through Messrs. Williams and Guion, New York:—208 bags of matte marked S S M Co., weighing 20,807 lbs. gross, net 20,697 lbs.; containing by assay—silver 480 ozs.; gold, 10 ozs. per ton of 2000 lbs.; and copper 24 per cent. net. You will be pleased to learn that our pyrites difficulty is over, at any rate for the present. We are now getting a regular supply from the 10th legion, and any deficiency is made up from the Harsh. I visited the latter mine on Friday last, and was much pleased with the appearance of the mine; the ore continues to improve as we go deeper. As soon as the lode is properly opened up we can easily command a supply for one furnace. I have been trying hard for the past fortnight to get some silver ore, but the weather has been bad, and many mines which only work in summer have not commenced. I have had to fall back on the Terrible Mine, and have arranged for the supply of 1 ton of their second-class ore per day, at a price which I hope will leave us a fair margin. If I find that we can work the ore satisfactorily I think I shall have no difficulty in increasing the supply. I think I can safely say that our troubles are nearly over, and that we shall now be able to proceed without those delays which have hitherto attended our movements. Our furnace is now steadily smelting, but our matte is poor, because the silver ore we have in stock is all low grade, not averaging more than about 40 ozs. of silver per ton. The supply from the Terrible will, I hope, enable us to enrich the matte somewhat. We are arranging our plans for the separation of the silver here.

CEDAR CREEK (Gold).—Telegram: T. B. Ludlum, May 14: "Total product last month, including water, $25,750; total mining expenses, $14,750; the profit is $11,000.

RICHMOND CONSOLIDATED.—Cablegram from the mine:—"Hall, London—Week's run, 825,000.—Probert."

SIERRA BUTTES.—Result of the working for April, received by telegraph on the 14th inst.:—Receipts, $38,080; cost of mining and milling, $21,087.

JAVALI COMPANY.—The directors are in receipt of advices, under date of April 6, from Capt. Solins. The mill had not been worked during the month, the dry season having set in. The engineer and millmen were clearing and making necessary repairs, and the water-course had been widened. Capt. Solins hopes to have everything finished and the new machinery erected by July 1, when the wet season sets in.

CRESCENT (Gold).—Capt. Stetson, April 16: Yesterday we struck in the western end of the first level of the Pet another lode, of better ore than I have found before. The Pet on the first level, just east of winze E, takes a turn almost south; this I followed 40 ft. from the winze, and came upon the lode, about 2½ ft. thick, and running east and west. It has good walls, and is, I think, the ledge I struck in running the drain tunnel. I have got the water down this evening 54 ft. below the third level. As soon as I can go down I will write you.

MALABAR (Gold Washing).—March 3: Nearly the whole of the property has been explored, and Mr. Clarke and myself have selected the mine most conveniently situated for opening out. We had very great difficulty in selecting the outlet, on account of the great extent of the deposit, and it being difficult to see the run of the ground, owing to the dense brushwood and luxuriant forest that had grown up since the works were abandoned by the Spanish. The outlet will be on the south side of the deposit, and discharge into the River Medina. The fall is rapid and great, so that there will be no difficulty in this respect. Colonel Sussan is now employed making a plan of the property, and when finished a copy shall be forwarded to the board.

I. X. L. (Gold and Silver).—L. Chalmers, April 21: Only 5 ft. last week. Rock cannot be much harder. The second pump is in, and working well.

EXCHEQUER (Gold and Silver).—L. Chalmers, April 21: The rock continues as hard as adamant; only 4 ft. made. Lost one shift on Saturday, two men having left on Friday, refusing to work 10 hours.—Mill: My foreman very unwell; my engineer off for a week on urgent business, when his is now almost the only work to finish. Sluices all but completed, and a fine new tank, capacity 1420 gallons, to feed battery; pans and settlers completed on Saturday. Foundations being graded for slime tanks and tailing reservoir. Some doors and stairways still to make, and the amalgam boxes, turning off the pullies, and the carpenter work of the quartz mill will be finished. When the engineer returns he ought to finish in 10 days.—Saw-mill: The turbine-wheel will be put in the moment I am through with the mill.

CHONTALES.—May 15: The directors have received advices from Mr. Smeddle, dated April 5: During the previous month 1982 tons had been crushed, which produced 333 ozs. of gold, at an average of 3/4 dwts. per ton. From the arastra they obtained 50 ozs. of gold, making a total of 383 ozs., value 1074*l.*; cost for the month, 947*l.*; net profit, 127*l.* The above cost includes the sum of 148*l.* charged to construction account. The health of the establishment continues good.

— Daniel Tonkin, Frances Velasquez, April 4: Herewith we beg to hand you our report of the mines for March month.—East San Benito Mine: The No. 1 stope in back of the No. 2 level, east of cross cut, has been stoped 5 varas, lode 4 feet wide, worth 2 dwts. of gold per ton. The No. 2 stope in the back of No. 1 level, east of cross-cut, has been stoped 14½ varas, lode 5 feet wide, worth 2 dwts. of gold per ton. The No. 1 stope in the back of No. 2 level, west of cross-cut, has been stoped 28 varas, lode 4½ feet wide, worth 3 dwts. of gold per ton. The No. 3 stope in back of No. 2 level, east of cross-cut, has been stoped 58 varas, lode 4 feet wide, worth 2 dwts. of gold per ton. The No. 2 level has been driven east on the lode 21½ varas, lode 4 feet wide, worth about 1½ dwt. of gold per ton.—West San Benito Mine: We have cleared out and repaired the level, and will in a few days be in a position to obtain quartz from this mine.—Santo Domingo Mine: The deep level has been driven west of cross cut on the lode 15 varas, lode 3 feet wide, worth about 1½ dwt. of gold per ton. The No. 1 level has been driven west 17 varas, lode 3 feet wide, worth 2 dwts. of gold per ton. The same level has been driven east 21 varas, lode 6 feet wide, worth 5 dwts. of gold per ton. A rise in back of the same level east has been risen 2 varas, lode 4 feet wide, worth 5 dwts. of gold per ton. A stope in back of same level has been stoped 85½ varas, lode 3 feet wide, worth 4 dwts. of gold per ton. A stope in back of the top level has been stoped 58½ varas, lode 4 ft. wide, worth 3 dwts. of gold per ton.—San Sebastian Mine: The main level is thoroughly repaired, and we are now repairing a rise in the back of the same.—Trinidad Mine: We have sent a few tons of quartz from an old heap in this mine as a trial of its value, and it produced about 3 dwts. of gold per ton. The quantity of quartz sent to the stamps is as follows:—From East San Benito Mine, 935 tons, yielding 2½ dwts. of gold per ton. From Santo Domingo Mine, 1028 tons, yielding 4½ dwts. of gold per ton. From Trinidad heap, 19 tons, yielding 3 dwts. of gold per ton; in all 1982 tons—333 670 ozs. of melted gold.

SAN PEDRO.—R. M. Kitto, March 15: New Shaft: We have completed cutting two plats at the 150, and are now engaged in sinking below. We intend sinking 6 metres for a fork or well, then put down skip road from the 135 to this point, which I calculate will take about three months to accomplish. The 150, a cross cut driving from shaft on an angle south 45° west to intersect the manto San Pedro, ground is quite solid and hard, in beautiful strata; all the joints in the stone are quite mineralised. Another cross-cut in the same level, driving from shaft in the opposite direction, or nearly so, I am thinking to drive due east to intersect several lodes and mantos. The ground here is also solid and hard, and we are paying 82*l.* per metre for each of these levels. Besides the Manto Verde there are several lodes running nearly due north and south, and this cross-cut will intersect the whole. I have no doubt we shall cut some rich lodes here. We must drive a few metres here before we put down the skip road; if not it is like to damage the woodwork by blasting near it. We cut the wall of manto in driving the 135 south of west, therefore it is suspended. A stope in the back of the 128, south part of manto, is without change since my last, and will produce 10 tons of 16 per cent. ore per fathom. A stope in the back of the same level, on the west part of manto, will produce 8 tons of 20 per cent. ore per fathom. A chiffon sinking below the 122, south part of manto, is producing good stones of ore. A stope in the back of the 122 will produce 2 tons of 20 per cent. ore per fathom. A tribute pitch in the back of the 122, south of new shaft, will produce 2 tons of 25 per cent. ore per fm. This pitch is working at ⅓ tribute. A chiffon sinking below the 116, to ventilate last named stope, is producing good stones of ore. A tribute pitch in back of 110, south of new shaft, at ⅓ tribute, will produce 3 tons 25 per cent. ore per fm. No. 3 level, a cross-cut driving toward big workings on discovery, ground still favourable. Santa Helena, San Antonia, and Cubo Mines are suspended for the present. I beg to state we have 13 men employed in sinking new shaft and driving the two cross cuts at the 150; as soon as we complete shaft, put down skip-road, &c., we shall put four or six men in the cross-cut.—San Pedro: I don't know how soon we may cut water here; for that reason I am afraid to put too much force before the shaft is sunk to the required depth and the skip road down. I am exceedingly well pleased with the appearance of the strata in the bottom of the mine. I have never known the indications to fail; all the joints being so mineralised it gives me the greatest confidence in cutting a rich manto of ore at the 150. I will force on all this work without any delay. We are working here all the time round, both Sundays and feast-days. I am glad to say we are getting on well with the erection of new store-rooms and shop, as well with making the new floors. I am preparing the floors-room to dress 10,000 quintals of ores per month when the machinery is erected. We shall also have to make a metal-house, or deposit, which shall be done in good time.

— Richard M. Kitto, March 31: The new shaft is sunk 3 metres below the 150; the ground is still solid and firm, and we have made good progress here in the month. The 150, driving south of west from shaft towards the Manto San Pedro, measured 6·30 metres from centre of shaft; the ground is very hard and firm, with all the joints highly mineralised. The 150, driving east towards the Manto Verde, measured 3·80 metres from shaft; ground hard. In the 135 a cross-cut is driving south, 59° west, from south part of manto, to intersect some parts of the manto split off from the back of the 128, which may improve in depth; the ground is favourable here. A stope in the back of the 128 will produce 3 tons of 20 per cent. ore per fathom; this stope is near the ladder-road on the north part of manto. A stope in the back of the 128, on the south part of manto, will produce 4 tons of 16 per cent. ore per fathom. A stope in the back of the 128, on the east part of manto, will produce 2 tons of 20 per cent. ore per fathom. A stope in the back of the 128, on the south part of manto, will produce 6 tons of 16 per cent. ore per fathom. A chiffon sinking in the bottom of the 128, on the south-west part of manto, will produce 3 tons of 20 per cent. ore per fathom. The cross-cut driving in the 135 is to cut this part of the manto in this chiffon; there is a little water, which makes me think there is yet more manto in this direction; we cut a wall in this cross-cut, and I suspended the same, as I advised you in my last report. A stope in the back of the 122, on the south part of manto, will produce 2 tons of 20 per cent. ore per fathom; the tribute pitch in the back of this level is suspended, as the tributers did not take it at the price offered. A chiffon sinking below the 116 for ventilation is producing good stones of ore. A tribute pitch in the back of the 110, south of new shaft, at one third tribute, will produce 2 tons of 25 per cent. ore per fathom. We are doing all that is possible until the machinery arrives. Everything is in good working order. We have still 13 men employed in sinking the shaft and in driving the two cross-cuts at the 150.

BUNKER HILL (California).—W. L. Palmer, April 22: The body of pay ore in the south end of the 170 is large, and of good quality. The cross-cut in the 270 is progressing day and night, and we have good ore in it. The mill looks better than ever, and the show of gold amalgam on the plates is better than in previous runs, indicating more yield from the ore.

WINAMUCK.—May 10: Telegram: April production, gross $79,881; net, $52,681; last nine days, gross $32,000.

COLORADO TERRIBLE.—Sales of ore have been reported to the value of $8859·32 to April 17. Monthly statement: Ore raised during the month of March, $2970; month's expenses, $2354·77; balance, $615·23; stock of ore at the mine unsold on March 31, $60,205, at 2s. 8d. per dollar = 11,037*l.* 11s. 8d.; value of shipments to England, 1300*l.*; total, 12,337*l.* 11s. 8d.

MONTE ALBO.—J. Williams, May 3: No. 7 level during the past month has been extended south from the whim engine-shaft 27 metres 20 centimetres; re-set to three men, at 20 f. per metre, for the month; the lode at present will yield about ½ ton per metre, and is looking very promising (new). No. 7 level, north from whim engine-shaft, is set to three men, at 26 f. per metre; the lode in this end is large, and producing good stones of lead ore, but not in sufficient quantity to value—a fine promising lode. The winze in the bottom of No. 6, south from whim engine-shaft, has been communicated to No. 7 level, which has well ventilated this part of the mine. The winze in sinking passed through some good ore ground, that will pay well for taking away; ground sunk during past month, 15 metres 5 centimetres. We have five stopes working to the south of the whim shaft, that will yield on an average a little over ½ ton per metre; at present they are somewhat improved. The total quantity of ground stoped during the past month is 147 metres. A new winze sinking in the bottom of No. 5 level, north of whim engine-shaft, will yield ½ ton per metre (not set). In the cross-cut east from No. 4 level, south from the whim engine-shaft, we have just cut the lode, which looks very well, but have not had time to drive through it to estimate its value; but judging from what we can see, I think we shall have a good run of lead ore ground north and south of the cross cut (not set). I will write you more fully on this point in the course of a few days. We now find, by driving this cross-cut, that the lode has been heaved by an east and west course, about 16 or 17 metres east; there can be no doubt but that we shall find the lode to the south of the above mentioned cross-course, by driving east on Nos. 5, 6, and 7 levels. We shall be in a position to commence driving Nos. 5 and 6 cross-cuts in the course of a day or two. The lode was very good home to the cross-course in both these levels, and I think we have every reason to expect a good run of lead ore on the other side. Julius Cæsar cross-cut north has been extended during the past month 10 metres 70 centimetres, and cut what we call Napoleon lode, which is small and poor. The cross-cut being hard and spare for driving we thought it advisable to suspend it for the present, and put the men to sink a winze on a lode of very considerable promise in the bottom of Julius Cæsar level, opposite the above-mentioned cross-cut, which is producing some good stones of lead ore; set to three men, at 40 f. per metre, winze to be carried 2 metres long and 1½ metre wide. The lode in the back of this level also holds forth good indications, where we have 35 to 40 fms. of backs; and I would recommend a rise being commenced at once at this point, which is just over the winze on the south part of the lode, the winze being sunk on the north part. The cross-cut north from B lode has been extended during the past month 7 metres 30 centimetres, without intersecting any lode or branch; re-set to three men, at 38·75 f. per metre, for the month. Quantity of lead ore dressed during past month, 112,573 kilos. In conclusion, I am pleased to say that the work both at surface and underground is going on very satisfactorily, and I am also pleased to say that both the engines have been working remarkably well during the past week.

LUSITANIAN.—May 6: Palhal: The lode in Taylor's engine-shaft, sinking below the 160, is worth 2 tons of ore per fathom. In River shaft, sinking below the 130, the lode is 6 ft. wide, composed of quartz.—Levels on Basto's Lode: In the 160, east of Taylor's engine shaft, the lode is 10 feet wide, composed of quartz. In the 160, west of Taylor's, the lode is 3 ft. wide, composed of quartz, mixed with country. The lode in the 150 east is 4 ft. wide, spotted with ore. The lode in the 140 east is 3½ ft. wide—unproductive. In the 130, east of River shaft, the lode is 3 ft. wide, composed entirely of quartz. In the 120, going in the same direction, the lode is 5 feet wide, yielding stones of ore. The lode in the 90 east is divided into two small branches, about 5 ft. apart, both of which are poor. The lode yields stones of ore in the 80, where it is 3 ft. wide, but in the 70 east it is small and unproductive. The branch in the 38, west of slide lode, is 6 in. wide, of soft country. The Mill lode in the 18, east of Taylor's, is 1 foot wide, yielding stones of ore; and in the 38, west of slide lode, of the same size, composed of flookan and spots of mundic.—Slide Lode: In the 140, south-west of Taylor's, the lode is 1½ foot wide, composed of flookan and schist. In the 130 north-east the lode is 1 ft. wide, spotted with mundic; and in the 110 south-west it is 2½ ft. wide, made up of flookan and schist. The adit cross-cut, south of the branch, west of Perez' shaft, is in hard ground. In the rise above the 110, east of Taylor's, the lode is 5 feet wide, yielding a little mundic.—Carvalhal: Great Lode: In the 40, east of Incline shaft, the lode is 1½ ft. wide, composed of quartz and spots of lead, but of no value.—Level on Copper Lode: In the deep adit, west of River Caima, we are stripping down the north side of the level on the north lode to open on the copper lode, which is very small, with spots of lead ore in it.—Valley Lode: The top adit level is being driven to cut the lode seen at surface; the lode is 2 ft. wide, composed of quartz, mundic, and lead, of which it has produced ½ ton per fathom for 2 fathoms in length where seen; it is found in the Palhal Mine boundary, about 200 metres from Carvalhal village north, and about 340 metres east of the River Caima, it has a good appearance, and we hope it will not deceive us as we have too often been.

PESTARENA.—Thomas Roberts, May 10: Val Toppa Mine: In the winze in the side lode in Zero level we have in the past week met with some good-looking stones of ore, and shall make a trial of it in a few days. No. 1 level end south, on the western part of the quartz lode, yields 10 tons per fathom, worth 10 dwts. of gold per ton. No. 1 level end south, on new lode, is not looking so well. The stopes now working are yielding a fair quantity of average ore. Owing to the scarcity of good miners we have not yet been able to put on a sufficient number at Val Toppa.—Cani Mine: Owing to a piece of mountain having fallen near the entrance of the Cava Veahia level, carrying away part of the footpath leading to the same level, we have suspended cross-cutting, and have resumed, by two men, an adit on the face of the mountain between Cani old workings and Sasso Neri Mine; estimated distance to drive about 15 metres. In this property we have another good point, and one that merits a cross-cut, which we purpose trying this summer; this will prove the ground under and eastward from the deepest or Old Cani level, and to all appearances the lodes have not been cut here. The cross-cut will not be expensive.

BENSBERG.—J. W. Hoffman, May 10: This week we received a further delivery of machinery from the makers, among which the chief thing was the washing trommell, a large and ponderous machine, weighing 3 tons, which we are now fixing in its position. We also commenced connecting the two boilers together so as to enable us to work each separately, or both together. The inclined plane is being pushed on; we shall set more men to work at it as soon as it is a little more forward, which will give more room to work in. In the open cast there is no change to report. The carbonate at the west end contains a quantity of sulphuret of lead, which is so clean that we can deliver it without any further dressing. I have advice from Rotterdam of the arrival of the pit pulleys and cast iron pipes for the pump. Production of ore for the week: carbonate, 30 tons of 45 per cent. assay; rock ore, 10 tons of 15 per cent. assay. Delivered, 30 tons of 45 per cent. assay; stock on hand (ready for market), 50 tons of 45 per cent. assay.

CAPE COPPER.—Despatches per Danube: The letters contain no news of importance. The Sir Robert McClure has been chartered at Port Nolloth to bring home a cargo of 300 tons of copper ore.

[For remainder of Foreign Mines, see to-day's Journal.]

CAMP FLOYD.—Prof. Clayton concludes his report as follows:—From a careful study of the character of your mines, and their general situation, I conclude that the work can be carried on at a small profit, with the chances of occasionally making a good strike of rich ore. Upon the whole, I do not think the chances are favourable for making large profits. I am not at all surprised at the mistake made as to the character of the ore deposits. Most persons would call it a true contact lode, and from the rich bunches of ore found in the outcrop, and its great size (from 6 ft. to 40 ft. thick), it really looked, from this stand point, to be an enormous lode, of fabulous value. In the opinions that I have given of the real nature of this deposit, I believe I stand alone among all the experts and scientists of this country that have seen it. I believe, however, that the classification herein given is the true one, and that future developments will prove it. I have seen no reason to question the good faith of anyone connected with the management of your interests here. All of them evidently believed in the correctness of their estimates of the character and value of the mines, and have acted in good faith throughout. The facts show that they have been mistaken, but not negligent or dishonest. You must raise more capital for the exploration of the mines, and I recommend that your agent be authorised to require title to some unexplored ground east and south of the Last Chance Mine.

SUTRO TUNNEL.—The Sutro Tunnel, in Nevada, is the largest mining enterprise of the kind in America. When completed to the Comstock lode it bids fair to revolutionise the system of mining upon that vein, and carry a portion of the business of Virginia City down to the little town of Sutro. Several of the Comstock companies have already reached a depth upon the lode of 1700 feet, and it is not unlikely that in a few years the limits of profitable mining from the surface will be reached along the whole length of its croppings. In addition to the constantly increasing expenses of hoisting and pumping from such great depths, the item of timbering has amounted to an enormous figure, and the three together eat up pretty nearly all the profits. The tunnel enters the mountains in the valley of Carson river, which flows at the foot of the range in which the Comstock lies. Its length, it is calculated, will be over 20,000 feet, or between 3 and 4 miles. It will intersect the lode at a vertical depth of 1800 feet, and of nearly 2000 upon the incline. Along its course four shafts are being sunk, distant from each other about 4200 feet, which will vary from 500 feet to 1500 feet in depth. When they are sunk to the proper level tunneling will commence in both directions, so that the progress of the whole work will be accelerated ninefold. Subsequently these shafts will be used for airways, which are absolutely necessary in an underground passage of such length. The tunnel is now about 3500 feet in length, and work is progressing on it rapidly. The first shaft has nearly reached its level, the second is within 400 feet, while the third and fourth have yet about 1000 feet to be sunk before tunnelling can be commenced. The Comstock lode employs to-day about 8000 men, and has produced as high as $16,000,000 in one year. Since its discovery about $160,000,000 have been taken out, and the mine still gives as great promise for the future as has been realised in the past. With the aid of the tunnel, the great bodies of water which are such an immense expense to the companies working on the lode, can be removed at no cost, and the entire workings carried on from its mouth.—*Salt Lake Tribune*, April 26.

COLORADO TERRIBLE.—The monthly statement has been issued, showing that they have now a market for second-class ore in Colorado, having sold in Georgetown during the past month 84 tons, at a total of $8859·32, and that the stock of ore on dump and on the way to Liverpool amoults to 12,337*l.* 11s. 8d.

THE COPPER TRADE.

The principal feature in this metal is the continued decrease of imports as compared with the last two years, and the largely increased exports. The figures which we append show a diminution in the quantities of copper, taking together decreased imports and increased exports for the first three months of this year, of 6209 tons compared with 1871, and 10,894 tons compared with 1872. Again, the three months' charters from Chili are 9700 tons only, against 12,400 tons for the first three months of 1872, and 10,650 tons for the same period of 1871. These figures should undoubtedly exhibit a considerable reduction in our stocks, but at present the greatest reduction that has been made from the highest total reached in the past 12 months is 2637 tons only. It, therefore, becomes apparent that consumers' stocks must have been brought down to an excessively low ebb, and this would seem to be confirmed by the hand to mouth buying that still prevails. The speculation in copper so prevalent last year has established a higher value to the metal to the extent of at least 15*l.* per ton. Buyers are very loth to admit this fact, and endeavour by their limited operations to cheapen the article, but for the past six months the fluctuations have been very slight indeed, and if the imports are to go on decreasing whilst exports increase in the same ratio throughout the next few months, as in those just past, the position of stocks must very materially change by Midsummer. The buyers' confidence in the market was so terribly shaken last October, and they still only purchase excepting for instant wants, and as speculation alone can never support a market however much it may rise an article temporarily, existing prices will have to be looked upon as the value of copper, even taking all its present favourable features into account. The sales and deliveries during April were considerable, but business was much restricted after the Easter holidays, resulting ultimately in 3*l.* to 4*l.* reduction in price. The current enquiries are, however, on a larger scale, and quotations have improved again. The home trade is moderately supplied with orders, but the demand is by no means excessive. Yellow metal is not in much request, shipments to all parts are very light, but present prices restrict business. The imports of copper into England for the first three months of the following years, were—1870, 11,605 tons; 1871, 15,895; 1872, 20,695; 1873, 15,069. The exports for the same periods, were—1870, 14,253 tons; 1871, 7981; 1872, 8041; 1873, 13,309.

The position from May 1, 1872, to May 1, 1873, was as follows:—

	Price.	Stock on hand.	Stock, including afloat and chartered.
1872—May 1	£ 101 0 0	....Tons 21,435	....Tons 34,256
June 1	107 0 0	21,595	35,495
July 1	104 0 0	20,213	37,447
August 1	103 0 0	27,733	39,753
September 1	90 0 0	27,922	39,989
October 1	84 0 0	29,342	41,409
November 1	86 0 0	28,940	40,651
December 1	85 0 0	30,753	41,473
1873—January 1	90 0 0	32,001	41,991
February 1	87 0 0	32,432	42,012
March 1	85 0 0	32,180	41,660
April 1	92 0 0	30,396	39,375
May 1	88 0 0	29,908	39,024

And the comparative positions at the same date of the past four years with the present are as follow:—

	Price.	Stock on hand.	Stock, including afloat and chartered.
1869—May 1	£ 71 0 0	....Tons 23,653	....Tons 34,599
1870—May 1	67 0 0	28,623	42,909
1871—May 1	65 0 0	24,817	43,112
1872—May 1	101 0 0	21,435	34,256
1873—May 1	88 0 0	29,908	39,024

HENRY ROGERS, SONS, AND CO.

Messrs. James and Shakspeare. Sales of furnace material have been confined to the Swansea Ticketing of Tuesday, when 30·2 tons of ore, averaging 19 per cent., fetched an average unit-age of only 15s. 7½d.; this decline may be in great part attributed to the disinclination of smelters to lay in stocks, whilst the labour question is in such an unsettled state (two of them, in fact, made no purchases whatsoever), notices having been given by some of the men for an advance of 25 per cent., and it is feared that a strike will result. The Chili telegram came to hand on Monday last, and advised charters of 2600 tons pure for the first half of April (1200 in bars and ingots, 1000 in ores and regulus for England, 200 in bars and 200 in ores and regulus for France), stocks on the Coast being estimated at 4500 tons; the corresponding figures for last year were 2300 tons and 5500 tons respectively. Prices of bars at Valparaiso on April 16 were equal to 87*l.* 5s. laid down in Liverpool, English conditions, but without commissions to merchants on either side. This news coming on a dull market caused a rapid decline in value, and prices at one time showed a reduction of fully 4*l.* per ton on those of May 1. This fall took place with scarcely anything offering, and even now our quotations must be considered nominal, as it would be difficult either to buy or sell at the rates given in our list. Sales of bars for the week were 875 tons, nearly all good ordinary brands, including Ormenetta, at 86*l.* 10s. down to 84*l.* cash, 86*l.* 5s., with fixed prompts ranging from three weeks to two months, 50 tons only being Lota, and those at 87*l.* cash. In Australian the transactions were only 485 tons, of which 85 Burra at 90*l.* 10s. to 91*l.* cash and six weeks, the remainder Wallaroo from 92*l.* 10s. down to 90*l.* 10s. cash, and 92*l.* to 93*l.* 10s. with fixed forward deliveries. English sorts are dull, but maintain a comparatively full range of values.

The following are the Government returns, from Jan. 1 to March 31, for this year, as compared with 1872 and 1871; and in order to show the quantity of metal imported, ore has been reduced as containing 15 per cent., regulus 50 per cent of pure copper:—

Imports.	1873.	1872.	1871.
Copper in ore ....Tons	1,920	2,227	1,746
Ditto in regulus	3,474	4,979	3,423
Ditto in bars, cakes, ingots, &c.	6,996	10,970	7,943
	12,390	18,176	13,112
Exports.			
Foreign copper	4,575	1,522	1,446
Raw English ditto	4,078	2,284	2,291
Manufactured ditto	2,502	2,225	2,415
Yellow metal	2,687	2,473	2,295
Brass	719	717	657
	14,561	9,201	9,004

The following were the deliveries from stock in England and France:—

	1873.	1872.	1871.
Jan. 1 to April 30 ....Tons	19,715	20,017	18,983
During April	4,180	3,870	5,417

The direct imports from the West Coast of South America into England during the month of April were equal to 2443 tons pure; into Havre 50 tons; and during the same period 991 tons of foreign copper entered the port of London, making together a total of 3484 tons. The mails received here from Chili during April advised charters for together 4233 tons, against 5226 tons during April, 1872, and 6700 in April, 1871. During the present year 12,799 tons have been so advised against 16,473 tons in 1872, and 12,591 tons in 1871.

Messrs. J. Pitcairn Campbell and Co. (Liverpool, May 15).—Heavy charters of 2600 tons are advised by cablegram from Chili for the first fortnight in April, and we have consequently had a very depressed copper market, with a decline of 4*l.* to 5*l.* per ton in Chili bars. A large sale of ore at Swansea on May 13 went at much lower prices—say, 15s. 7½*d.* for an average unitage of 19 per cent. Quotations are 84*l.* 10s. to 86*l.* 10s. for Chili bars, and ores and regulus nominally 16s. to 17s. As we write the feeling is less gloomy, with more inclination to buy at current rates. During the past fortnight about 1200 tons Chili bars changed hands at from 90*l.* 10s. down to 84*l.* 10s. per ton. Arrivals here during the fortnight of West Coast S.A. produce—Cambrian, from Valparaiso, with 60 tons bars; Ismay, from Valparaiso, with 12 tons bars; Sorata, from Valparaiso, with 100 tons bars and 100 tons ingots. At Swansea—Silurian, from Carrical, with 420 tons ores and 300 tons regulus. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—

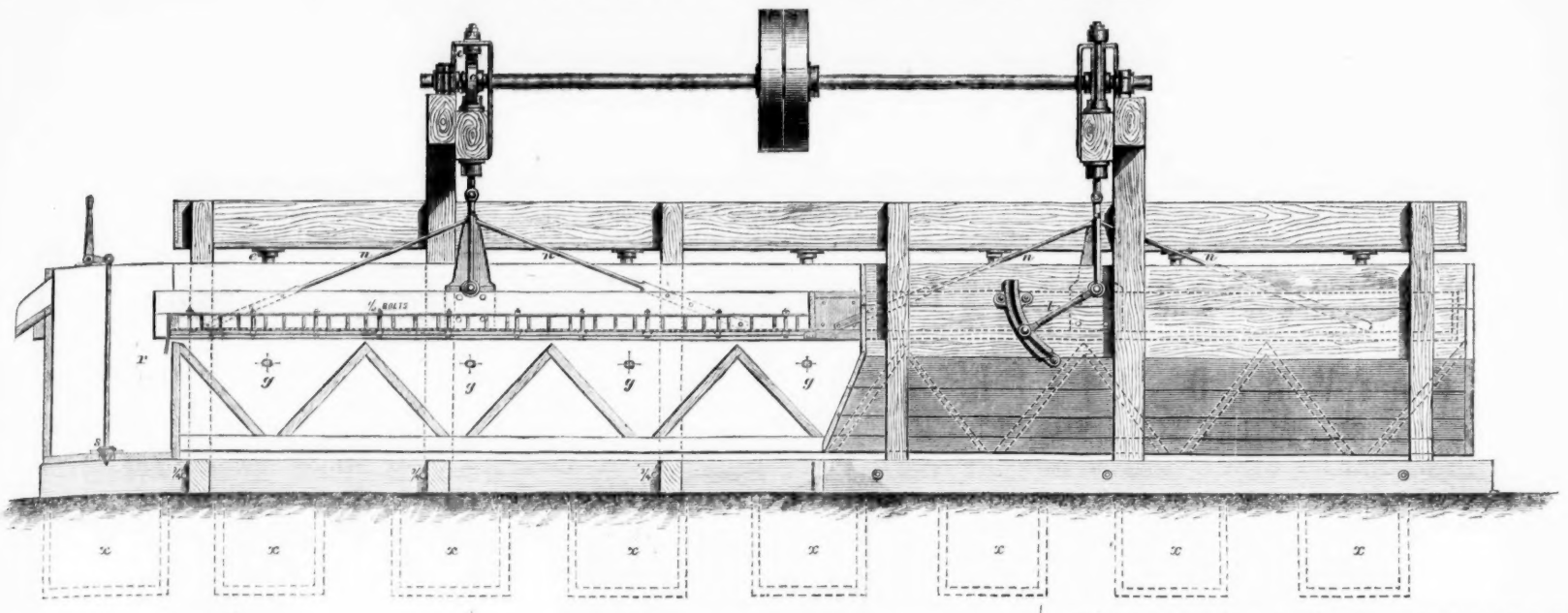
	Ores.	Regulus.	Bars.	Ingots.	Barilla.
Liverpool	309	921	14,994	517	—
Swansea	2066	2301	3,221	50	—
Total	2375	3222	18,215	567	—

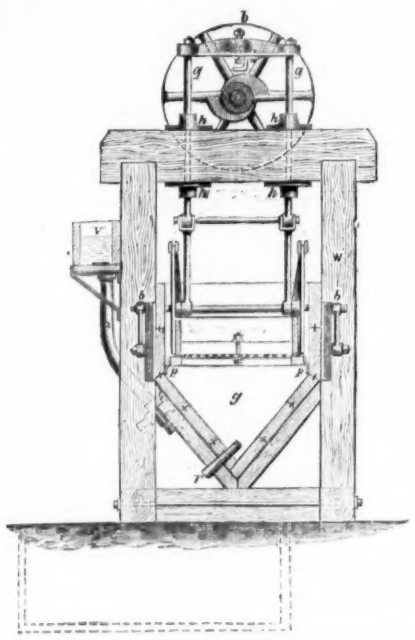
Representing about 20,700 tons fine copper, against 12,600 tons May 15, 1872; 20,600 tons May 15, 1871; and 17,000 tons May 15, 1870.

Messrs. Vivian, Younger, and Bond.—After our last issue very little business was transacted, awaiting the Chili news, and on May 12 the charters for the first fortnight of April were advised as equal to 2600 tons in fine copper (1200 tons bars and ingots, and 1000 tons ores and regulus for England, and 200 tons ores and regulus, with 200 tons bars, for the Continent), the estimated stock available being 4500 tons, showing a slight reduction on the preceding fortnight. This news, coming upon a market already sharing in the general depression, produced a bad effect, and prices at once gave way; Chili bars, which had previously been selling at 87*l.*, sold at 86*l.* down to 84*l.* 10s. for good ordinary brands, and 86*l.* to 85*l.* two months prompt. Wallaroo sold down to 91*l.* and 90*l.* 10s., and 90*l.* 10s., the market closing flat at quotations. English in very limited demand at 94*l.* for tough, and manufactured has been obtainable during the week at 96*l.* for 4 by 4 sheets, but latterly, owing to a demand for an advance in wages on the part of the men at several of the works at Swansea, the smelters are now cautious in quoting. At the Swansea Ticketing on Tuesday, 2032 tons ores, chiefly Australian and Cape, sold at an average of 15s. 7¼*d.* per unit; average produce 19 per cent. Cape ores realising 16s. 2*d.* per unit., being a decline of 1s. 6*d.* per unit on the previous sale.

LONDON GENERAL OMNIBUS COMPANY.—Traffic returns for the week ending May 11, 19,436*l.* 14s. 8*d.*

ORE DRESSING MACHINERY.





ORE DRESSING MACHINERY—No. XXV.

PERCUSSION SIEVE JIGGER.—In the year 1866 the mining engineer, Hugo Preuss, introduced at Pribram a jigger in which movement was given to the sieves by means of eccentrics, and the progression of the stuff accomplished by a continuous flow of water. Each sieve measured 39 in. long, 20 in. wide, and 9 in. deep. One sieve was slightly set below the other, the first delivering the stuff to the second, and the second to the third. The ore was lodged on the bottom of the inclined sieves, and after passing through regulators delivered into pyramidal-shaped chambers. The three-sieve frames were rendered moderately water-tight in the hutch by strips of leather 3 in. deep, attached to the former and pressed against the latter by the action of the downward movement. Some time ago Capt. Hancock, the able manager of the Moonta Mines, introduced a long continuous jigger, with a radius bar affixed to the sieve, for the purpose of giving a slightly forward motion during its upward movement. The driving gear consisted of a cam wheel, a series of side levers, one connected with another, side rods, and cross-heads braced to the side frame. The driving-wheel, side levers, and arbors were set below the hutch. The wire-work of the sieve bottom, in one of the jiggers, was for the first 4 feet five holes to the inch, then six holes, until within 6 inches of the end, when the mesh was four to the inch.

In another machine the first 6 feet consisted of six holes, followed by 14 feet of eight holes, and 6 inches of four holes. The sieve made 150 strokes per minute, length of stroke $\frac{3}{8}$ in., throw of sieve 3-16 in. In the arrangement illustrated the percussive motion is given to the sieve by means of a single shaft and a couple of cam wheels. Fig. 1 shows the hutch and sieve partly in longitudinal section and elevation, while Fig. 2 exhibits a transverse section of the hutch and sieve, also an elevation of the rods, gear, and framework—*a*, driving shaft; *b*, fast and loose riggers; *c*, double cams; *e*, lifting piece; *f*, cross-head; *g*, side rods; *h*, guides; *k*, hanging bars; *l*, radius bars; *m*, slides; *n*, truss rods; *o*, sieve bottoms; *p*, leather strip fastened to sieve frame; *q*, ore compartments; *r*, box for receiving water and sand; *s*, valve for regulating and discharging sand; *t*, pipes for supplying water to sieve compartments; *u*, water launders; *v*, wooden plug for drawing off ore and orey stuff, one plug being fitted to each compartment; *w*, framework bracing the hutch together and carrying overhead gear; *x*, boxes for receiving stuff discharged from the sieve compartments. The length of the sieve bottom is 20 ft., and of the hutch 22 ft., depth of hutch 3 ft., of sieve frame 6 in., of ragging bars $2\frac{1}{2}$ in., length of each ore compartment 2 ft. 10 in. By shifting the radius bars, *l*, in the slides, *n*, the throw of the sieve may be lessened or increased. The stroke also can be lengthened or shortened by raising or lowering the set screw, *y*. The quantity of stuff which can be jigged per day will vary with the size of grain, and the difference of density between the waste and the ore.

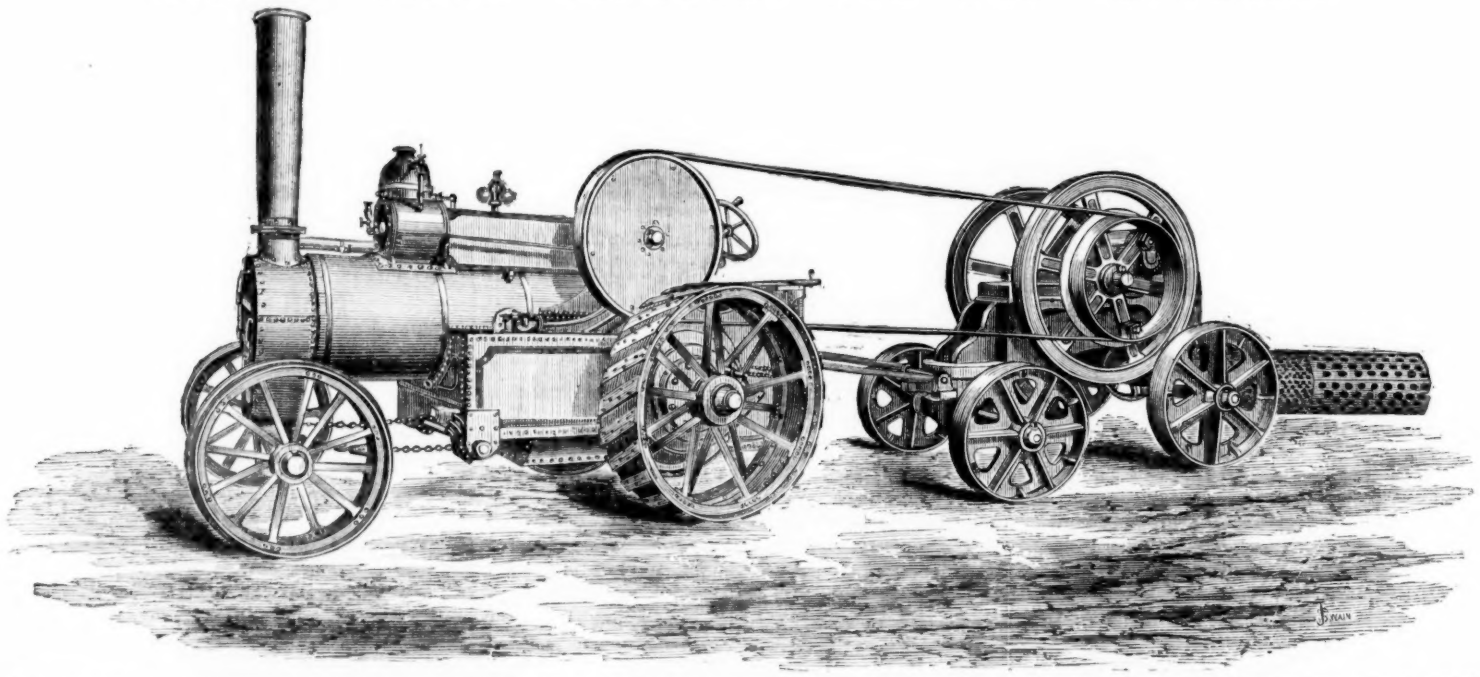
The radius bar is the subject of a patent, and is particularly described and illustrated in Hancock's specification, No. 2051, A.D. 1872.

2, *Coleman-street-buildings.* JOHN DARLINGTON.

ROCK BORING OR DRILLING.—Messrs. RAND and WARING, of New York, have patented some improvements in rock boring or drilling apparatus. This invention consists of a peculiar combination and arrangement of stand and actuating cylinders for supporting and working rock boring or drilling apparatus. The stand is mounted on adjustable weighted legs, and the actuating cylinder worked by steam or compressed air is contained within an outer cylinder, within which it works to and fro, and by means of suitable steam ports serves at the same time as its own slide valve for admitting steam to opposite sides of a piston inside the inner cylinder, which piston imparts motion direct to the boring tool.

SMELTING IRON.—Messrs. E. WITHY and WM. GIBSON, of West Hartlepool, have invented some improvements in mixing, charging, and smelting iron ores, the object of which is to save fuel. In effecting this, in the first place, the ores are crushed and ground, and the smaller they are ground the less fuel they take to smelt them. Secondly, the pulverised ores are mixed with the required quantity of lime and water to a stiff paste, which paste is forced into moulds or through dies, in a similar manner to drain tiles, the dies being made to give such shape or form to charging sections as will afford the greatest amount of heating surface, according to the weight and strength of the materials.

BLAKE'S STONE BREAKERS AND ORE CRUSHERS.



The stone-breaker is now so extensively recognised as a necessary portion of the plant required for successfully and economically carrying on the operation of rendering ores marketable, that it is at all times interesting to learn what progress is making calculated to bring the machine more closely to absolute perfection than it is already; and the name of Mr. H. R. MARSDEN, of Soho Foundry, Leeds, to whom the mining community is indebted for the introduction of the stone-breaker into this country, is so well known to our mining officials that it will be generally gratifying to learn that several of the most recent and important improvements have been brought forward by him. There has been some discussion lately as to the size at which ore should be supplied to the stamps, and although upon this point opinions are not unanimous, all practical men seem to be agreed that the best results are obtained when comparative uniformity of size is carefully maintained. To secure this uniformity, with the least possible trouble and expense, Mr. Marsden has designed and patented an improved cubing jaw, which enables the machine to perform its work without making any appreciable quantity of dust, and to reduce the stone to fixed sizes, at a cost not exceeding 3d. per ton. The extent to which Blake's stone-breaker has been appreciated by practical men cannot be better judged of than from the consideration of the many medals and awards it has received at the various Polytechnic and similar societies at which it has been exhibited, and of the large number—now nearly 800—in constant and every-day use, and the further improvements now added by Mr. Marsden are in every respect calculated to bring it into still greater favour.

By one of his latest arrangements Mr. Marsden has succeeded in dispensing with belts, and all similar contrivances for the transmission of power most effectually, by bringing his motor to bear directly upon the jaw, and he is at the same time enabled to run his machines in couples, and thus get the maximum of work done with the power employed. There is the further advantage, too, that the space required is very much reduced, and one foundation carries both the engine and crusher. The result is obvious: the first cost is is less, the wear and tear is less, and the hindrance sometimes unavoidable when belting is used is altogether avoided. A very compact little horizontal engine is mounted between two fly-wheels, of about 3 tons weight, care being taken to keep the crank-shaft of the engine at whatever level it is proposed to have the crank-shafts of the stone-breakers. The engine and fly-wheels are then boxed in, and the portions of the crank-shaft which continue through the casing form the crank-shafts of the stone-breakers, and thus communicate motion to the jaws of the machines. (We intend to illustrate this arrangement at an early opportunity.) When he uses 56 lbs. of steam with an engine of 14 in. diameter of cylinder and 20 in. stroke, Mr. Marsden finds no difficulty in running a pair of his breakers, taking in stones 15 in. by 7 in., and these working at their normal speed of 125 revolutions per minute will break down 18 tons per hour, which would prove ample for most mines; but should a still greater amount of work be required there is no inconvenience in increasing the speed of the engine, so as to make the production 22 tons per hour, and the cost is found not to exceed from $1\frac{1}{2}$d. to $2\frac{1}{2}$d. per ton, according to the superior arrangements for feeding and taking the material away.

For the production of road metal the machine has been found exceedingly valuable, and now that Mr. Marsden is offering a combined traction engine and stone-breaker, it will prove the most economical means of performing this kind of work that need be desired. The mode in which the transmission is effected will be understood from the above diagram, which, however, represents a single stone-breaker, furnished with a traction engine to put it in motion.

At the recent meeting of the Ayr Agricultural Association a first-class prize medal was unanimously awarded to the machine, and the local Road Trustees, after carefully examining it and thoroughly satisfying themselves as to its working, authorised the purchase to be concluded by Mr. Shaw, clerk to the Trust. The stones provided for the trial were from Parkthorn Quarry, the hardest in the district. Its chief superiority over every other stone-breaking machine is attested by its having uniformly taken the first prize at English and Scotch agricultural exhibitions, both for durability and the size of the broken metal. It was remarked that the machine had the great advantage of taking in large stones as they come from the quarry, instead of requiring them to be broken by hand. For the production of road metal the cubing jaw, already mentioned, is extremely valuable; it is simple, and consists in an extension of the lower end, and giving a curved form backwards to the moveable jaw: thus the orifice of delivery is made to terminate a parallel channel of some 3 or 4 in. in length, wherein the corrugations of the fixed and moveable jaws are so arranged as to alternate the one with the other—ridge against furrow, and *vice versa*, and the action of this jaw leaves little to be desired in regard to the evenness and regularity of the resulting sample of broken stone. As a machine capable of turning three cubic yards of broken stone per hour, with four-horse power, can be obtained for a first cost of less than 150*l*., it is certain that its price will not prevent its use on any mine, and there seems everything to justify the observation that the large number of orders continually coming to hand suffice to establish its merits, whilst recent trials show that it is the only machine of its kind which can truly be pronounced a perfect success.

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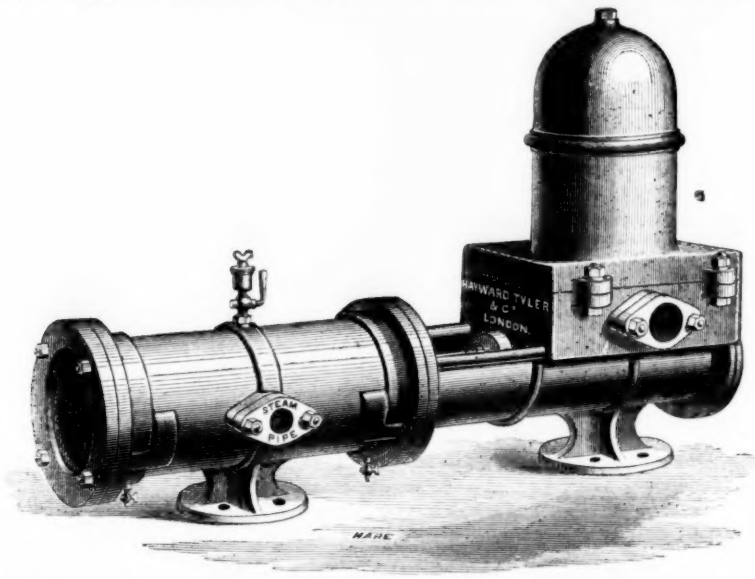

The rapid and continued increase in the demand for these pumps for coal mines is the best testimonial to the remarkable success which has attended them, even under the most difficult circumstances.

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For remarkable instances of their powers see *Times*, Dec. 14, 1872; *Globe*, Dec. 10, 1872; *Morning Advertiser*, Dec. 9, 1872; *Engineer*, Dec. 20, 1872, &c. See also descriptions in the *Colliery Guardian* and *Mining Journal*.

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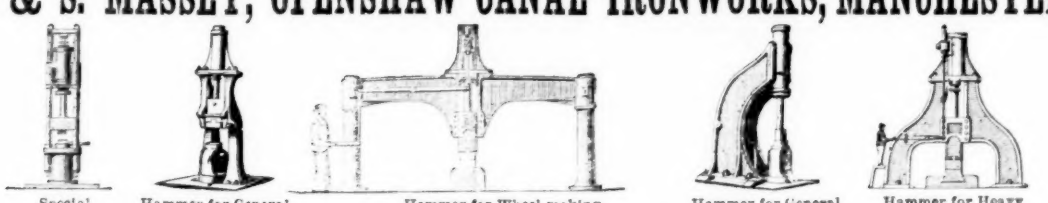

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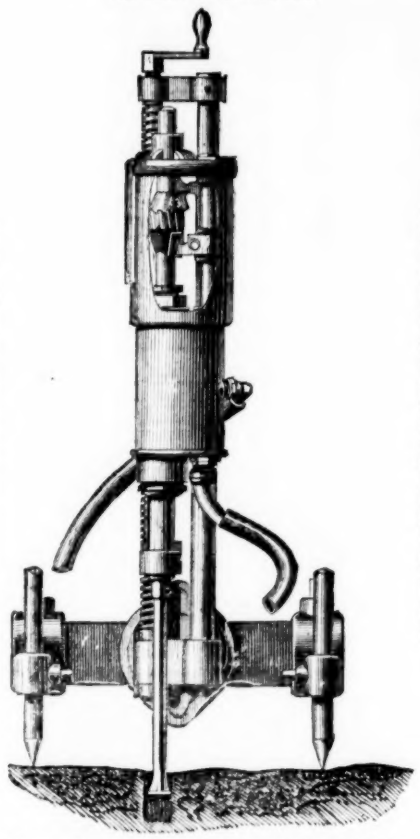

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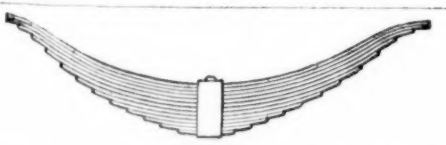

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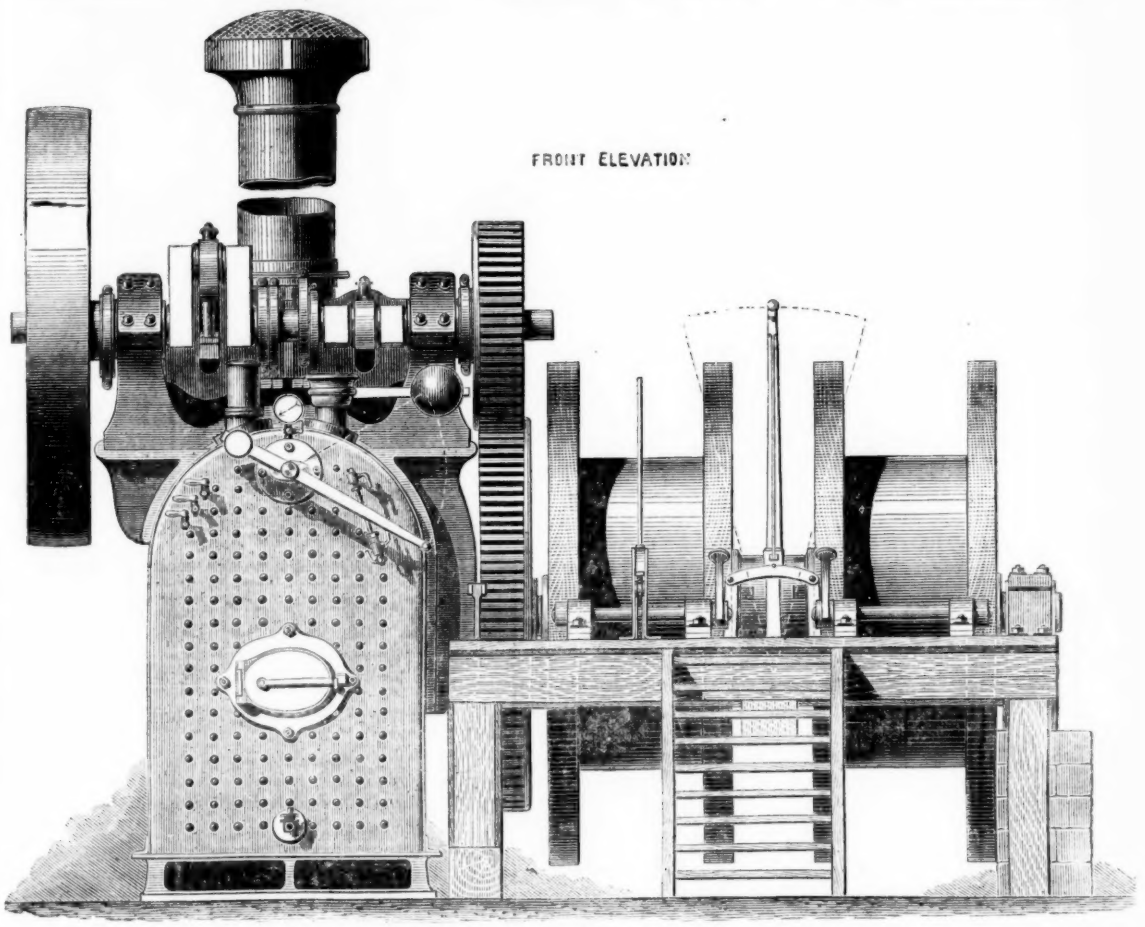

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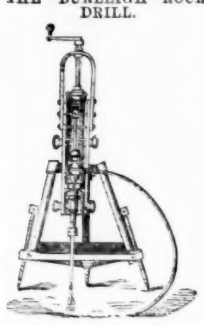

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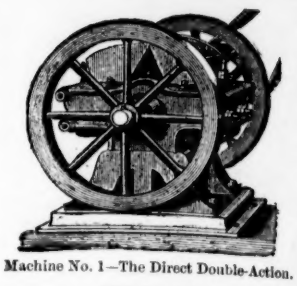

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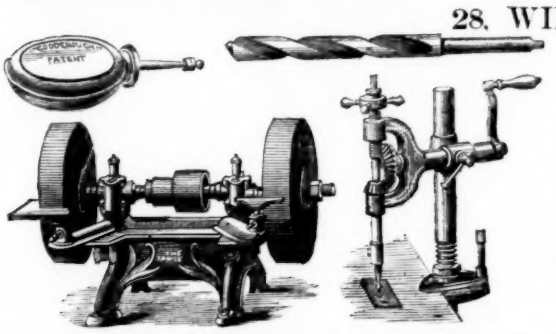

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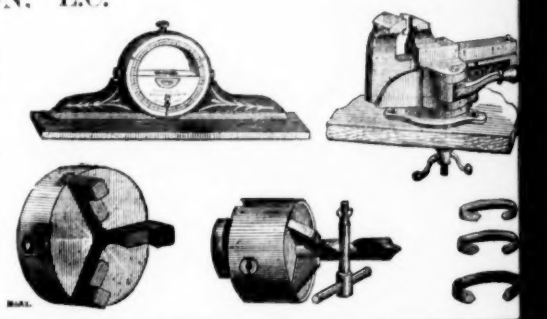

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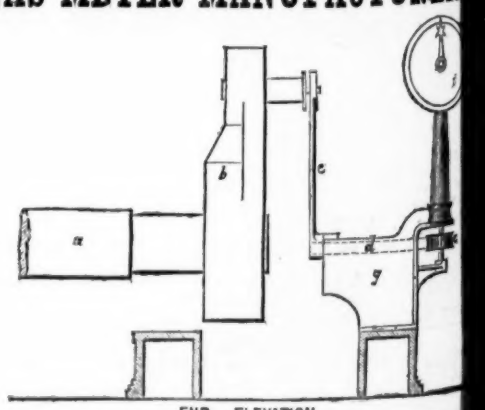
This Indicator is especially adapted for Water Winding or Pumping. Its indications cannot possibly be tampered with, and unerringly show the number of windings or strokes for any stated period, so that it will at once be seen whether or not the person in charge has been fully discharging his duty.

These Winding Indicators are supplied either with or without the Self-registration Dial.

The Pepper Mill Brass Foundry Company will be glad to furnish, on application, sets of drawings illustrative of the simplest and cheapest mode of attaching their indicators to engines of various constructions, either vertical or horizontal.



END ELEVATION

One mode of attaching Indicator to horizontal engine.

These Indicators have been supplied to most of the principal Collieries in Lancashire, including Wigan Coal and Iron Co. (Limited); Ince Hall Coal and Cannel Co. (Limited); Messrs. Jonathan Blundell and Son; John Grant Morris, Esq.; Messrs. Pearson and Knowles; Messrs. Andrew Knowles and Sons; Cannock and Rugeley; Mostyn Coal and Iron Co.; Messrs. Pilkington Bros., St. Helens.

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